

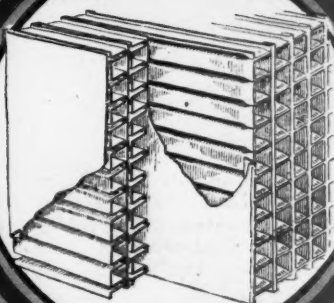
MOTOR AGE

VOLUME XXI

CHICAGO, FEBRUARY 8, 1912

NUMBER 6

McCord



CELLULAR RADIATORS

When the name McCord is used with the word Radiator the automobile world listens. This new McCord Cellular Radiator is the result of years of experience and study and is a fitting companion product of the universally used McCord Tubular Radiator.

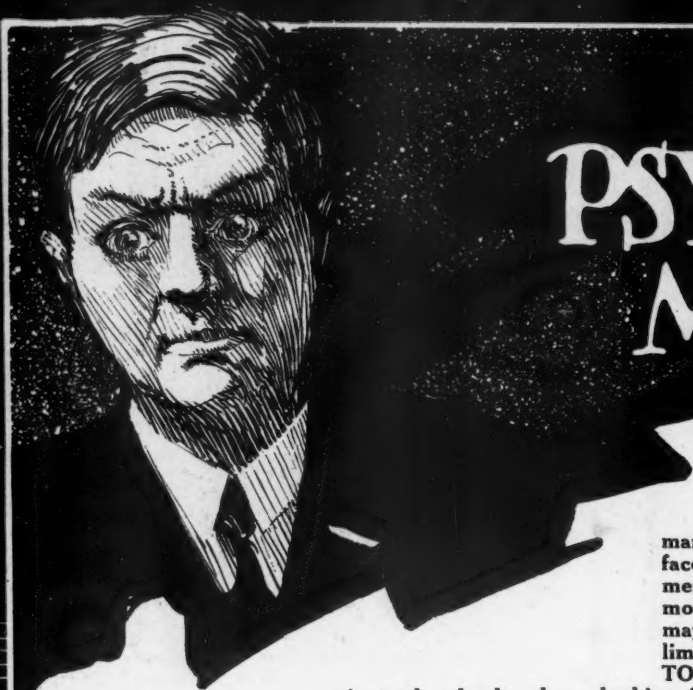
It is simply though remarkably well designed and of great efficiency and beauty.

The name McCord guarantees par excellence in material and workmanship.

You will see it at the shows in our exhibit and on many of the 1912 models.

McCord Manufacturing Co.

Detroit



The PSYCHOLOGICAL MOMENT

WHEN an automobile buyer is filled with perplexity, when his demands are very exacting, and he is brought face to face with the greatest number of satisfying requirements in a single car—that's the psychological moment! No matter how exacting his demands may be or his standard of value, or his financial limit, when he sees the complete line of LEXINGTON cars, he smiles with satisfaction. He has found

just what he has been looking for. There are no loopholes—designs, quality, and prices dovetail with his means, his judgment of car construction, and his taste.

The buyer who is looking for a good, sound, dependable utility car at a minimum cost, finds his ideal in the LEXINGTON Popular Model—touring car or roadster—at \$1400.

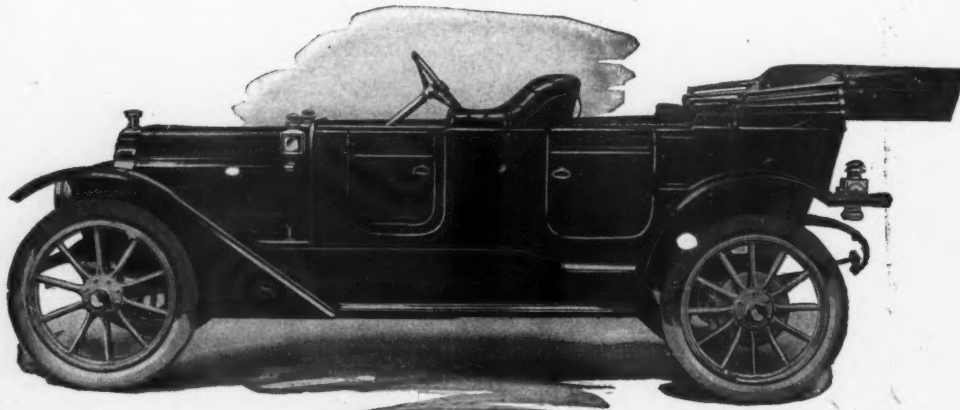
For the past two years the LEXINGTON Standard Model at \$1775 has struck the keynote in big value—good-as-can-be-wished-for automobile value. It is furnished in touring car or roadster.

The buyer who wants the best four-cylinder automobile on wheels, who is willing to pay a little more for the luxuries and ultra-fashionable refinements, will find in the LEXINGTON Master Model—touring car or demi-tonneau at \$1975, and coupe at \$2500—the highest expression of automobile constructive genius. This model is self-starting, magnificently equipped, supplied with specially designed Rutenber motor, Bosch magneto, Warner transmission, Timken axles, generator, electric lighting and everything else that is best.

The buyer who appreciates the easy riding qualities of a six-cylinder car and can afford the same in the most elaborate, thoroughly-well and fashionably equipped style, is invariably delighted with the LEXINGTON Perfect "Six" at \$2500. It represents the LEXINGTON ideals of car construction in their fullest perfection. Its little details of refinements and comfort flatter the discernment of the owner, appeal to the passengers, and create comment wherever the car is seen. It is a noticeable car on any boulevard.

Dealers to whom a complete line of quality cars brings a message are requested to write for our proposition. A telegram brings immediate attention.

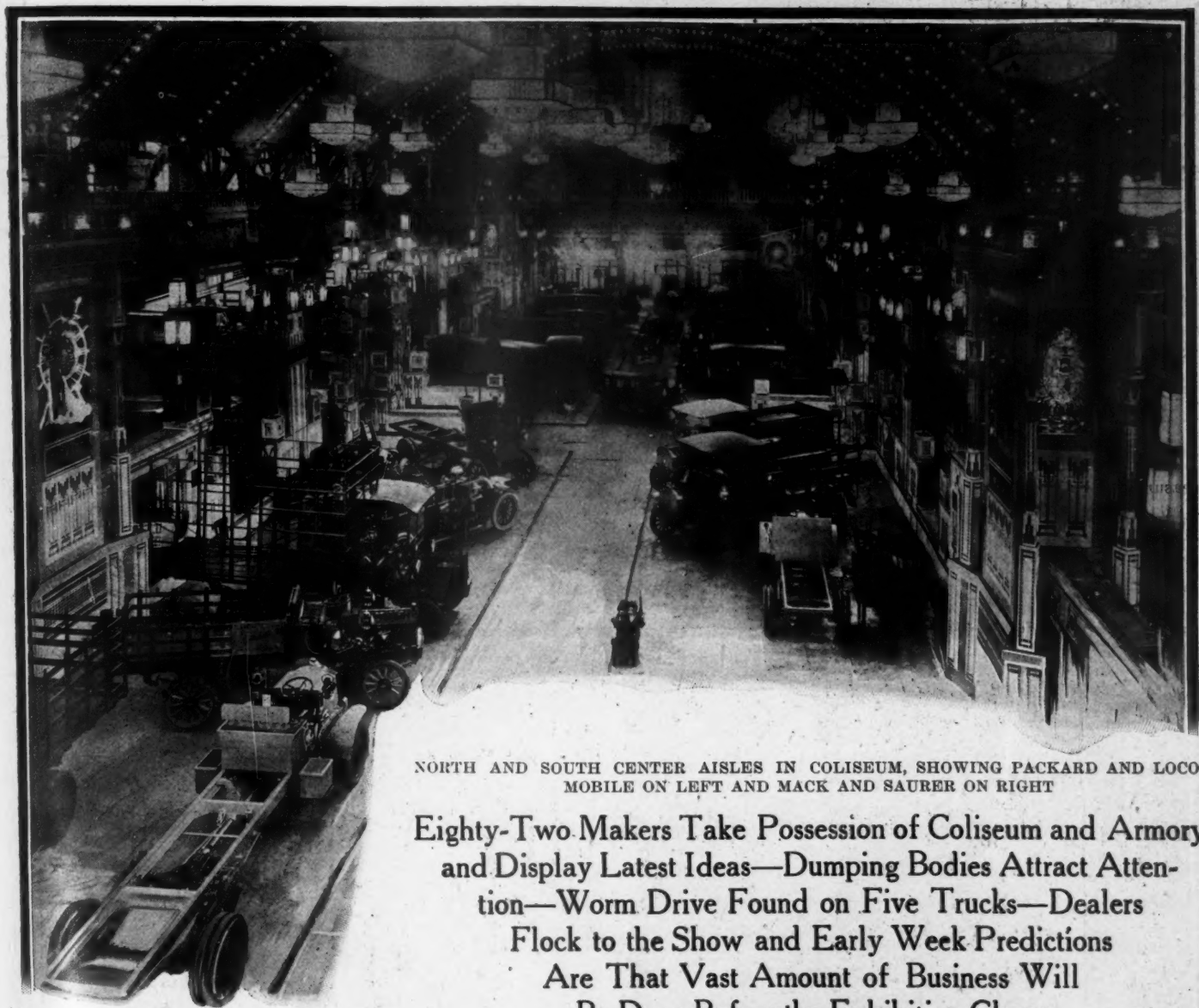
LEXINGTON MOTOR CAR COMPANY
Connersville, Indiana



MASTER MODEL TOURING CAR, \$1975.

MOTOR AGE

Chicago Views the Commercial Cars



NORTH AND SOUTH CENTER AISLES IN COLISEUM, SHOWING PACKARD AND LOCOMOBILE ON LEFT AND MACK AND SAURER ON RIGHT

Eighty-Two Makers Take Possession of Coliseum and Armory and Display Latest Ideas—Dumping Bodies Attract Attention—Worm Drive Found on Five Trucks—Dealers Flock to the Show and Early Week Predictions Are That Vast Amount of Business Will Be Done Before the Exhibition Closes

CHICAGO, Feb. 6—With the opening of the second week of the Chicago show, the half that is devoted to the commercial car interests, it is apparent that the business standard set up last week will be continued and perhaps on an even more extensive scale. The commercial car show opened yesterday morning and when the lights went out last night the building was filled with satisfied exhibitors who

predict the best business week they ever have experienced at any shows held so far. Agents are here from all parts of the middle west, many of them eager to close for territory while others have come to look over the power wagon field and determine for themselves whether or not the business is one in which they would care to invest their money.

The show itself, however, is not confined

to the wholesale end of it, for yesterday there was a turn-out of business men far in excess of anticipations, and this on a day when it generally is supposed that the business man is too much engaged in his own office to take time to visit the show.

The transition from a pleasure car show to a power wagon display was an easy one, and was made without a hitch. The



VIEW FROM GALLERY LOOKING NORTH—WHITE IN FOREGROUND

pleasure car show closed on schedule time at 10:30 o'clock Saturday night; 2 hours later the Coliseum and armory had been vacated by the pleasure car fraternity; a gang of painters had gone to work repainting the floors, other workmen were engaged in taking down the pleasure car

signs and substituting the business car labels, and there was an organized hustle that made it very apparent that the routine of evacuation and occupation would be followed without a hitch. This proved to be the case and by afternoon Sunday nearly every exhibit was in place

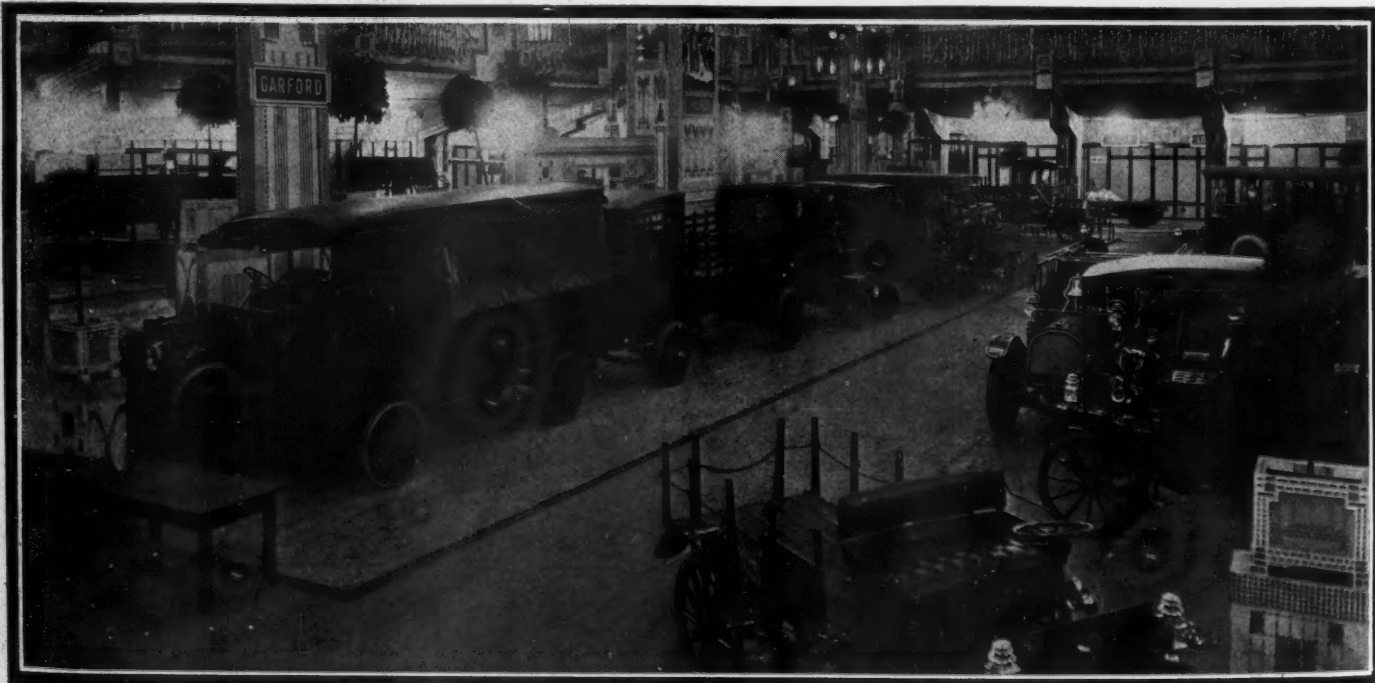
and the show people settled back for the opening the next morning.

The opening disclosed a lay-out that was remarkable in comparison with that of the previous year. Whereas in 1911 the Coliseum was plenty large enough to accommodate the fifty-one makers of trucks who displayed their wares in the show, this time it has been necessary to overflow into the armory and even at that no space has gone begging. Even the little odd-shaped booths in the obscure corners, large enough to accommodate only one truck, have been eagerly grabbed, and the only way more exhibitors could be cared for would be to cut down the space of some of the larger concerns. The only difference between this and the pleasure car show of last week, so far as space is concerned, is that the Coliseum basement has been deserted, a fact which will cause no one to weep.

Eighty-two Makes Shown

There are just exactly eighty-two different makes of commercial vehicles on display in this show and one may get an idea of the magnitude of the Chicago display by remembering that the two New York shows together only had seventy different makes, thirty-seven being in the garden and thirty-three in the palace. The accessory display at this show is almost as large as last week, only one exhibitor dropping out of the Coliseum, while about half of those on the second floor of the annex were forced to vacate because of the room being needed for the motor cycles.

Chicago has attracted many makes which were not seen in New York and which make their initial bow at this western show. There are at least twenty-eight in this category, including the Bessemer, Blair, Commerce, Dain, Dart, Diamond T,



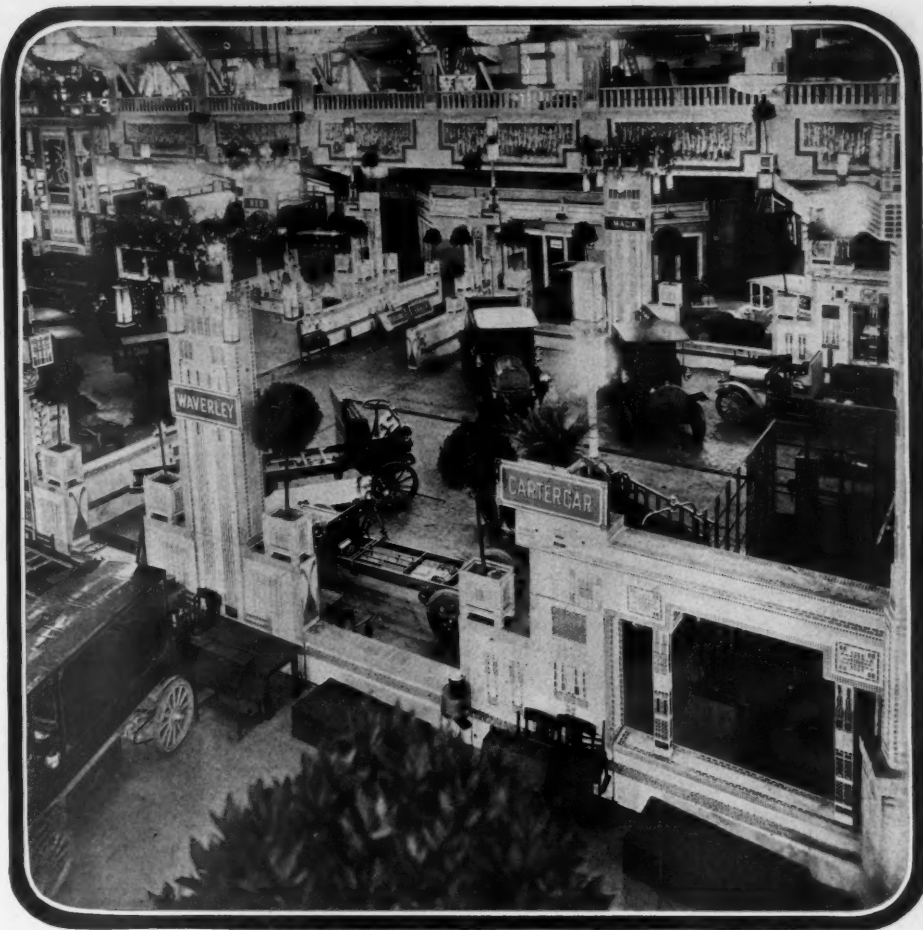
CENTER OF COLISEUM SHOWING THE GARFORD AND REO EXHIBITS

Dorris, Harwood-Bailey, L. A. W., Old Reliable, Mogul, Motor Wagon, M & P electric, Nateco, Packers, Poss, Sandusky, Sanbert, Schmidt, Service, A. O. Smith, Speedwell, Staver, Stegeman, Whitesides and Wilcox. In addition there are others like the Best, G. M. C., Locomobile, Lozier, Sternberg and U. S. Motors, which were at New York but which are being shown for the first time at Chicago.

The show is fairly bristling with new features, many of which were seen at New York; but at the same time Chicago has the honor of having introduced several novelties in the way of construction. There is a pronounced trend in the way of dumping bodies; fire-fighting apparatus is seen in many stands; but apparently there are not so many as displayed a year ago; several fine examples of ambulance body work are to be seen, while the fact that interurban motor service is becoming more popular is evidenced by the display of buses that is being made, examples of which are found on the stands of the White, Autocar, Buick and one or two others. A. O. Smith comes into the show for the first time with his new truck, which was completed only very recently and which goes into the worm-drive class along with four others, the Pierce-Arrow, Blair, Stegeman and Dain. Of these five the Pierce-Arrow was the only one with this type drive in last year's show. The Stegeman has it only on one of its models.

Some of the Dumping Bodies

In the way of dumping bodies notable displays are made by Mack, Pierce-Arrow, Alco, Sampson, Gramm and Speedwell. All but the Speedwell were on view at New York, but the latter comes to the Chicago show with a steel body that is dumped by means of racks and pinions actuated by a crank through a train of



FROM THE WEST GALLERY, SHOWING WAVERLEY, CARTERCAR AND MACK

idle gears. There are several trucks with bodies designed for use in the lumber industry including White, Packard and Knox, while unique is the Peerless oil truck with a huge cylindrical body. An oddity that is found in the armory is the Monitor light delivery with the driver's

seat on the right, while the carrying capacity of the truck is almost unlimited. Because of the driver's seat being isolated as it is, occupying only the right half of the body width, it is possible to pack lumber or tubing to the left and permit it to extend several feet in advance of the



EAST AISLE COLISEUM, LOOKING NORTH FROM CENTER, SHOWING PIERCE-ARROW STAND



SOUTH HALF OF CENTER AISLE IN COLISEUM, SHOWING REO AND KELLY

body of the truck proper if necessary.

Studying the trend of the show, it is apparent that left-hand drive has won many advocates during the past year, for at least 45 per cent of the machines on view has the steering wheel placed on the left, and in nearly every instance where the wheel is so placed the gearshift is located in the center. The smaller vehicles nearly all use left-hand control. It also is noted that oftentimes where center gearshift control is used that the emergency brake is placed on the left.

There is a great variety of motor locations, some of the engines being placed under the floor and with the driver back of it; there are instances where the motors are high enough to split the seat in two; and other instances where the floor boards itself is divided in order to permit of the motor being located at that point. In the case of the smaller trucks especially where a two-cylinder opposed motor is used, the engine is located under the body.

Examples of Friction Drive

There are several examples of friction drive, notably the Dain, which uses a principle that differs from the ordinary in that its transmission is used only for low speed and reverse, the construction being such that on high the transmission stand dormant. In this the transmission consists of two disks set at an angle to each other, which on low speed or reverse are rotated by the rim of the flywheel being brought into frictional contact with their edges. A friction wheel slidably connected with the propellor shaft and mounted between the disks receives the power from the face of the disks.

Then, too, there are such other features as removable power plants, as instanced in the cases of the Grabowsky and Sandusky. The former has been on the market for some time but in the case of the latter the idea is new. The Autocar and Knickerbocker also have this feature. With the Atterbury it is possible to remove the entire power plant as a unit,



EAST AISLE IN COLISEUM, LOOKING NORTH

the only disconnection to be made being the wire that connects with the spark. In order that the plant may be slid forward, the steering column is so constructed that it is possible to lift it from its socket and get it out of the way. The Velie has a screen protection for the radiator which is not seen on other trucks, while the L. A. W. differs from the conventional by having the radiator placed behind the motor on the order of the Renault. The Lippard-Stewart is similarly designed. Another feature that is discovered only by investigation is on the Commer, which has a spring dog-clutch gearset which shifts a gear simply by pushing out the clutch, it being necessary of course to make the shift before, but not making it actual until the clutch is disengaged.

Electric commercial wagons are much in evidence, being shown by the Anderson Electric Co., General Vehicle Co., Lansden Co., M & P Electric Vehicle Co., Walker Vehicle Co., and Waverley Co. The trend here has been increased simplicity, accessibility of batteries, better wiring and simplicity of control.

One might go on almost indefinitely and talk about the features of the Chicago show, for never before has there been a display of commercial cars where so many new ideas of construction have been uncovered. That this fact is appreciated is shown by the interested crowds in the booths, which is a marked contrast to last year, when most of the spectators who went to the show contented themselves with wandering idly up and down the aisles instead of trying to find out something about the construction of the trucks themselves.

Many Dealers at the Show

If one is to judge by the attendance the first day, this will be a big business show which will be remarkable because of the attendance of the dealers. There ought to be more agencies placed at this show than there were at last week's for the reason that the truck makers have almost a virgin field in which to work. In the

1912 82 MAKES

1911 51 MAKES

1907 21 MAKES

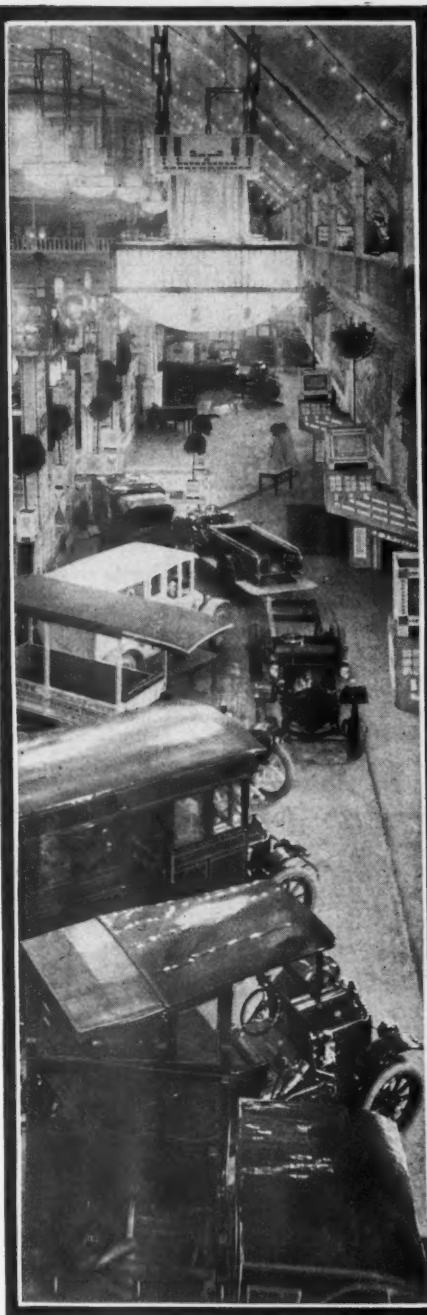
RELATIVE SIZES OF CHICAGO COMMERCIAL SHOWS

case of the pleasure car folk most of their territory was closed last summer and only the loose ends were gathered up during show week. Now, however, the commercial show is attracting new blood.

It is apparent that the personnel of the truck agents differs widely from that of the pleasure car field and it looks now as if this branch of the industry would attract to the business many men from other professions who hitherto have not figured on selling motor cars. Candidates for agencies who have so far talked with exhibitors come from many walks in life. There are contractors, who believe in the future of this industry and who are attracted for the first time; there are men who heretofore devoted their time and money to marketing farm implements and who now intend to broaden out; there are bankers even who are now willing to invest their money where they have fought shy in the case of the pleasure car.

Placing of Agencies

This problem of placing agencies is one that is being given considerable thought by the truck makers, but not all of them have mapped out a definite policy in this regard. There is one big concern, however, which has gone about the matter in a scientific manner. This concern demands first of all that the agent buy a demonstrator and then that he put up a cash deposit of \$350. He must be a man of standing in his community and be able to furnish garage accommodations that will insure service to his customers after he has sold them the trucks. The curbstone dealer is not desired and he receives scant courtesy when he knocks at the door. In assigning territory care is



WEST AISLE IN COLISEUM. LOOKING SOUTH

CHICAGO 82 MAKES

GARDEN 37 MAKES

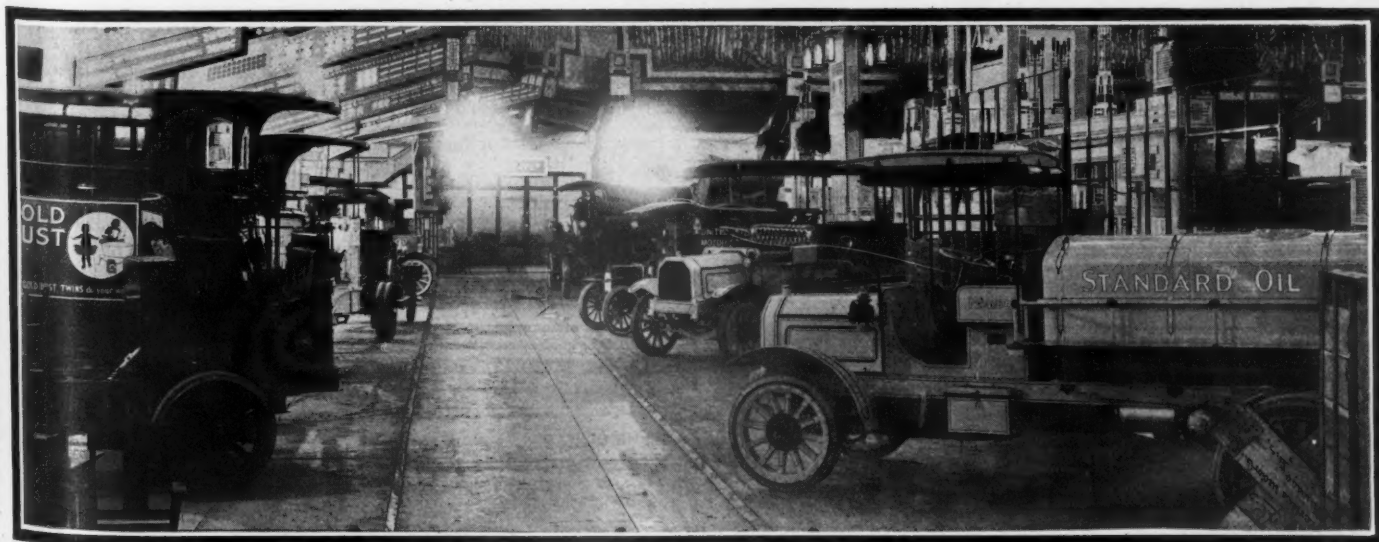
PALACE 33 MAKES

RELATIVE SIZES OF NATIONAL COMMERCIAL SHOWS

taken to see that no agency is placed in a town of fewer than 25,000 inhabitants. When an agency is placed in such a town the dealer is given other territory which gives him a drawing account on at least 100,000 people. It is figured that the absorbing capacity in such a territory is at least one truck to every three horse wagons.

Service and Installation

In discussing the situation with prospective dealers the truck manufacturers at the show are placing a special stress upon service and scientific installation. They point out that in order for a dealer to be successful he must study the needs of his prospective customers and be in a position to advise him, scientifically as to what style of body he should use, the size of the truck and other points that are necessary for success of the truck after it has been installed, etc. It is pointed out to them that the truck business is different from the pleasure car end of the industry in that most of the work of selling comes at the beginning. For instance, when a big concern is interested for the first time it generally takes from 6 weeks to 2 months to sell the first truck; the second one generally is sold after 2 weeks of effort, and the third after a few days. Then it generally is clear sailing, for the business man has had a chance to discover the capabilities of that particular make, and if he is satisfied with the work of the truck it is easy from then on. One instance is reported at the show of where a concern, after buying three trucks at different periods, bought fifteen more without additional solicitation or demonstration.



EAST AISLE OF COLISEUM, LOOKING SOUTH FROM CENTER—PEERLESS ON IMMEDIATE RIGHT

R. C. Hupp Interests Increase Stock

Name of Corporation Changed in Accordance with Court Decree and Plans Made for Large Output—Klein to Have New Plant at Richmond—Foreign Car Manufacturers Organize Big Association

DETROIT, Mich., Feb. 7.—In a merger that was consummated several months ago, the several interests in which R. C. Hupp was interested were brought together in one corporation capitalized at \$800,000. At a meeting of the board of directors Saturday the capital stock was increased to \$1,000,000. The creation of this additional \$200,000 of preferred stock was taken up by the shareholders of the present company. It was also decided to rename the company after the R. C. H. gasoline car. Papers already have been filed with the secretary of state in Lansing, and hereafter the company will be known as the R. C. H. Corporation.

New buildings and extensive additions are already under way on South Lyceate street. The corporation will market 10,000 R. C. H. cars and 1,000 Hupp-Yeats electric pleasure cars and electric trucks for 1912. The R. C. H. Corporation will comprise a foundry, drop-forge plant, assembly and experimental buildings, paint shops, machine shops and several others.

Details of the consent decree handed down by Judge Murphy last Wednesday in the case of the Hupp Motor Car Co. against the Hupp Corporation, Robert C. Hupp and Louis G. Hupp have been given out. There are eight sections in the decree. The first calls upon the defendant to change its name to R. C. H. Corporation, or any other name of which the word Hup or Hupp is not a part, within 15 days and it is ruled that the defendants shall not, after this period of time in the corporate name under which they do business use or permit the use of the word Hup or Hupp alone or in combination with other letters of the word and shall publish no advertisement for the sale of any gasoline motor car or parts thereof which shall include the words Hup or Hupp except as provided in sections 2 and 4 of the decree.

Section 2 says "that defendants or any of them shall not use or permit the use of the word Hup or Hupp as part of the name or designation of any gasoline motor car or parts thereof produced by them or any of them, provided however, that the names of the individual defendants may be used in connection with the name of any part to truthfully designate the relation of said defendants or either of them, to said part, but not in connection with any advertisement for the manufacture or sale of any completed or finished gasoline motor car and they are severally enjoined accordingly."

Section 3 prohibits any written or printed statement or advertisement that Robert C. Hupp was or is the maker or designer of the Hupmobile or of any portion of the Hupp Motor Car Co.'s product. Section 4 limits the size of type that may be used by Robert C. and Louis G. Hupp in advertising matter in connection with the manufacture of gasoline motor cars to half the size of the type or letters of the corporation's name. However, the Hupps are permitted to sign their names as officers of such corporation to its letters written in the course of its business.

In section 5 the Hupps are given the right to engage in the manufacture of gasoline cars, subject, however, to the right of the Hupp Motor Car Co. to seek preventive relief if it deems itself aggrieved by improper use of the name Hup or Hup. It is recognized that the Hupps have placed advertising for publication in the near future that cannot be changed, so that advertising will be permitted. No costs are awarded either party.

RECOGNIZE GRANT PATENT

New York, Feb. 5.—Settlement of the litigation instituted by the Consolidated Rubber Tire Co. against the Hartford Rubber Works and Morgan & Wright on account of alleged infringements of the Grant patent, held by the Consolidated, has been made in the United States court. Under a series of orders entered last week the defendant companies acknowledge the validity of the patent in question and take out licenses to manufacture tires under its terms. The Grant patent covers the use of two circumferential wires embedded in the substance of the tire itself. It has only about 1 year to run. This type of tire has been made by the Kelly-Springfield interests for a number of years.

KLINE TO HAVE BIG PLANT

Richmond, Va., Feb. 3.—The Kline Motor Car Co., which was incorporated here several months ago, and in which local capitalists are interested, has acquired 15 acres of ground beyond the boulevard, and abutting the state fair grounds, where dirt has been broken for the plant which will be one of the largest in the entire south. The factory site has a frontage of 1,300 feet along the Seaboard Air Line Railway's property, and 1,225 feet on the boulevard. With sidetracks of the Seaboard running into the yards the question of drayage will be eliminated when the plant is completed.

Since the incorporation the Kline Motor Car Co. has been having the Kline manufactured at York, Pa., under contract, but as soon as the Richmond plant is completed the cars complete will be manufactured here.

It is expected that the plant will be completed by the first of July, this year. The building, which will be of brick, with concrete foundations and concrete floors, is really two buildings in one. Each will be 600 feet long and 60 feet wide. It will be of colonial style, two stories high. Running full capacity the plant will give employment to 1,000 men, 60 per cent of whom will be skilled and high-paid mechanics.

GETS MORE DELCO TERRITORY

Chicago, Feb. 6.—It is announced today that the Aristos Co. of New York which handles the Mondex line, has secured the middle west territory for the Delco self-starter including Indiana, Illinois, Iowa, Minnesota, Kansas, and Missouri, formerly handled by John H. Palmer. The Aristos Co. already had the eastern territory for the Delco and this but adds to its holdings. Mr. Palmer will continue with the company and will look after the middle west with headquarters in Chicago.

CAMERON CREDITORS TO MEET

New York, Feb. 6.—A meeting of some of the creditors of the Cameron Motor Car Co., of Beverly, Mass., will be held at Salem, Mass., on Saturday. According to Herman Steinberg, attorney for the Eise-mann Magneto Co., schedules filed indicate a total liability of \$200,000 against which there are assets of unknown size and character. Among these assets is real estate assessed at \$62,000, upon which there is a mortgage of \$31,000. The machinery is covered by a chattel mortgage of \$10,000 and there is due an open account of \$17,000.

FOREIGN CAR MAKERS ORGANIZE

Paris, Jan. 28.—After grouping themselves nationally, the motor car manufacturers of Europe have banded themselves together in an international union. The organization took place at Brussels during the motor exhibition in that city, and united Great Britain with the Society of Motor Manufacturers and Traders; France, with the Chambre Syndicale des Constructeurs d'Automobiles; and Germany, Belgium, and Switzerland, each with their national manufacturers' societies.

Invitations to join in the movement were sent to America and Austria without any reply being received, and Italy was not invited owing to the entire absence of a motor manufacturers' association in that country. It is probable, however, that the Italian manufacturers will unite themselves and come into the inter-

Fisher in Stoddard-Edwards Project

national union just formed at an early date. Armand Peugeot, who is president of the French Syndicate of Manufacturers, was elected president of the Union Internationale des Constructeurs d'Automobiles, as the new body will be called, and it was decided to fix headquarters in Paris. The vice-presidents of the union are E. Manville, president of the British Society of Motor Manufacturers and Traders; Count de Liedekerke, president of the Belgian syndicate, and Dr. Vischer, vice-president of the German syndicate. The secretary of the union is M. Cezanne, with offices in Avenue Alaphand, Paris.

The formation of the union is a proof that the car manufacturers of various countries are not necessarily enemies. It is believed that by the formation of this organization agreements can be arrived at which will be beneficial to the world's motor industry, and consequently to the individual constructors forming the membership of the union. One of the most important matters with which the union will deal will be that of shows. It will be possible to form a calendar of shows succeeding one another at such intervals that one set of exhibits will do for the complete series. Thus this year the first show will be held in London, probably in November, followed by an exhibition in Paris during the month of December, with the Brussels and Berlin shows at later dates. It is possible, too, that some agreement will be arrived at with regard to uniform decorations so as to obtain the greatest possible benefits at the lowest possible cost. Already, as the result of the agreement, it has been made clear to foreign exhibitions that there will be no preferential treatment towards home factories at the next Paris show. Spaces will be drawn for by lot.

The union will be keenly interested in the simplification or abolition of all regulations tending to limit foreign travel. It is realized that the fewer difficulties are encountered at frontier stations, and in obtaining driving and car licenses, the greater will be the use of cars and the larger will be the number of cars sold.

FEAR AN A. C. A. OLIGARCHY

New York, Feb. 7—Special telegram—Henry Sanderson, president of the Automobile Club of America, has been formally called upon to issue a special notice for a meeting of the club prior to the regular meeting scheduled for February 19 to protest against the passage of the new bylaws. The call was signed by seventy-seven members, several of whom are charter members of the club. The protesting faction declares that the club is endeavoring to set up an oligarchy and that under the new bylaws the governors would control the officers and that the board would be self-perpetuating.

Company Being Formed in Indianapolis with \$1,000,000 Capital Which Will Take Up Manufacture of Knight-Engined Cars—Prest-O-Lite People Interested in Deal—Hoosier Factory Is Planned

INDIANAPOLIS, Ind., Feb. 7—Representatives of several commercial organizations met at Commercial Club yesterday afternoon to discuss the formation of a company with \$1,000,000 capital. Carl G. Fisher presided and about \$140,000 in stock has been sold and subscribed. If organized, the company will begin operations with about \$750,000. Associated with Fisher in the project are C. G. Stoddard and H. J. Edwards, formerly active in the management of the United States Motor Co., and who have an option on fourth American license to build Knight type of motors. Fisher and James A. Allison have offered a site of 20 acres for the factory near the belt railroad and use of the motor speedway for testing. It is said that the car to be built would sell for less than \$3,000 and that trucks using the Knight motor would also be built.

GARDEN QUESTION UNSETTLED

New York, Feb. 6—The corporation that is figuring on leasing Madison Square garden will have a meeting the latter part of the week to take definite action in the matter. While negotiations are going on no announcement has been made. However, it is said that when the lease is signed it will date from Monday, February 5. It also is declared that the original plan of erecting an office building has been abandoned, and a statement has been made unofficially by the New York Central Railroad that the Arena can be completed to such a degree by next fall that it can be used for motor car show purposes next year. However, it is most likely the garden will be used for the 1913 shows and the Arena finished leisurely, which will save at least \$100,000.

ASKS FOR ELKHART RECEIVER

Elkhart, Ind., Feb. 6—Alleging that mortgages aggregating \$63,700 on the real estate formerly owned by the Elkhart Motor Car Co., of this city and later transferred to the Elmer Auto Corporation, are due; that the property has been abandoned and is deteriorating to the damage of creditors represented by the mortgages, Claude E. Jackson has filed suit in the superior court at Goshen, Ind., to foreclose the mortgage and asks that judgment for \$3,000 be given him as one of the creditors and that a receiver be appointed for the property.

Some of the allegations of the complaint are that the Elmer Auto Corporation was created for the purpose of taking over and manipulating the assets of the Elk-

hart Motor Car Co., the interests of the promoters; that real estate and mortgage securities of the Elkhart Motor Car Co. were conveyed without authority and without consideration to the Elmer Auto Corporation; and that H. H. Elmer, chief promotor and benefactor, who claims to own the real estate in fee simple, has gone to Cleveland and abandoned the property in question.

The defendants are George L. and Carrie L. Schofield, Harry H. Elmer, Charles L. Monger, A. B. Cline, Salisbury Wheel and Mfg. Co., Racine Mfg. Co., Wisconsin Motors Co., United Manufacturers, Detweiler & Co., Winkel Co., Standard Oil Co., and the Malleable Iron Co.

CARLSON CASE CONTINUED

New York, Feb. 7—Special telegram—On motion of counsel the suit of the Carlson Motor and Truck Co. against the Maxwell-Briscoe Motor Co. in the United States court of appeals went over to next week when it will be heard by the full bench. The defendant company is alleged to use a combination of a removable coverplate with connected cam followers which is claimed to be in violation of patent 797,555, issued August 22, 1905, to Charles A. Carlson. The suit was commenced in April, 1907. The defendant claims that the Carlson device was anticipated by prior art in this country and abroad. Should the patent be upheld by the United States circuit court of appeals the complainant will proceed against many concerns using similar ideas.

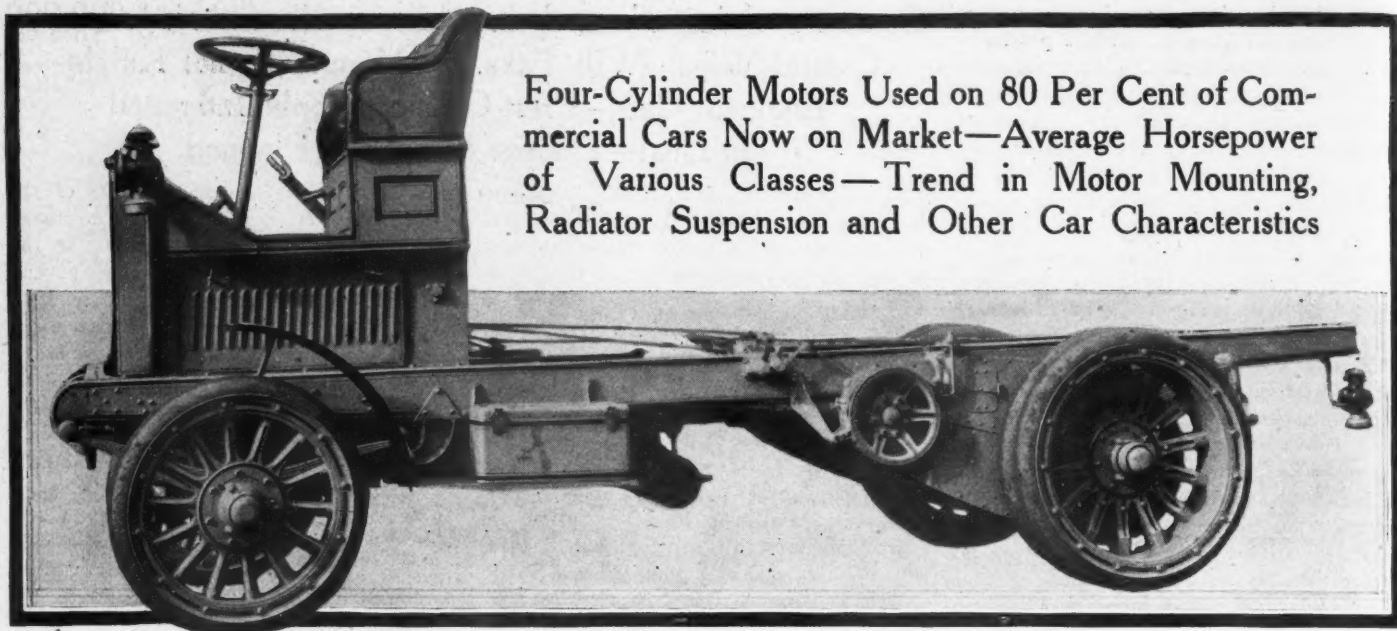
SPARK PLUG CASES IN MARCH

New York, Feb. 6—The spark plug cases have been placed on the calendar of the United States district court for next month, proofs having been closed. These are the suits entered by the A. R. Mosler Co., which owns the Canfield basic patent covering the construction of spark plugs that provide for an air chamber around the electrode. The defenders of the action are Mezger, Rogers, Rajah, Belgian and American Coil Co.

KRUPP SECURES OPTION

Pittsburgh, Pa., Feb. 5—The Pittsburgh industrial development commission, which is conducting a campaign for the location of diversified interests, announces that the Krupp Motor Works, a new concern organized for the manufacture of motor cars, has optioned a 13-acre tract near Ambridge, Pa., upon which it is proposed to erect a concrete plant at a cost of \$75,000.

Truck Tendencies as Noted at Show



CHASSIS OF NEW 5-TON LOZIER SHOWING USE OF CHAIN CASES

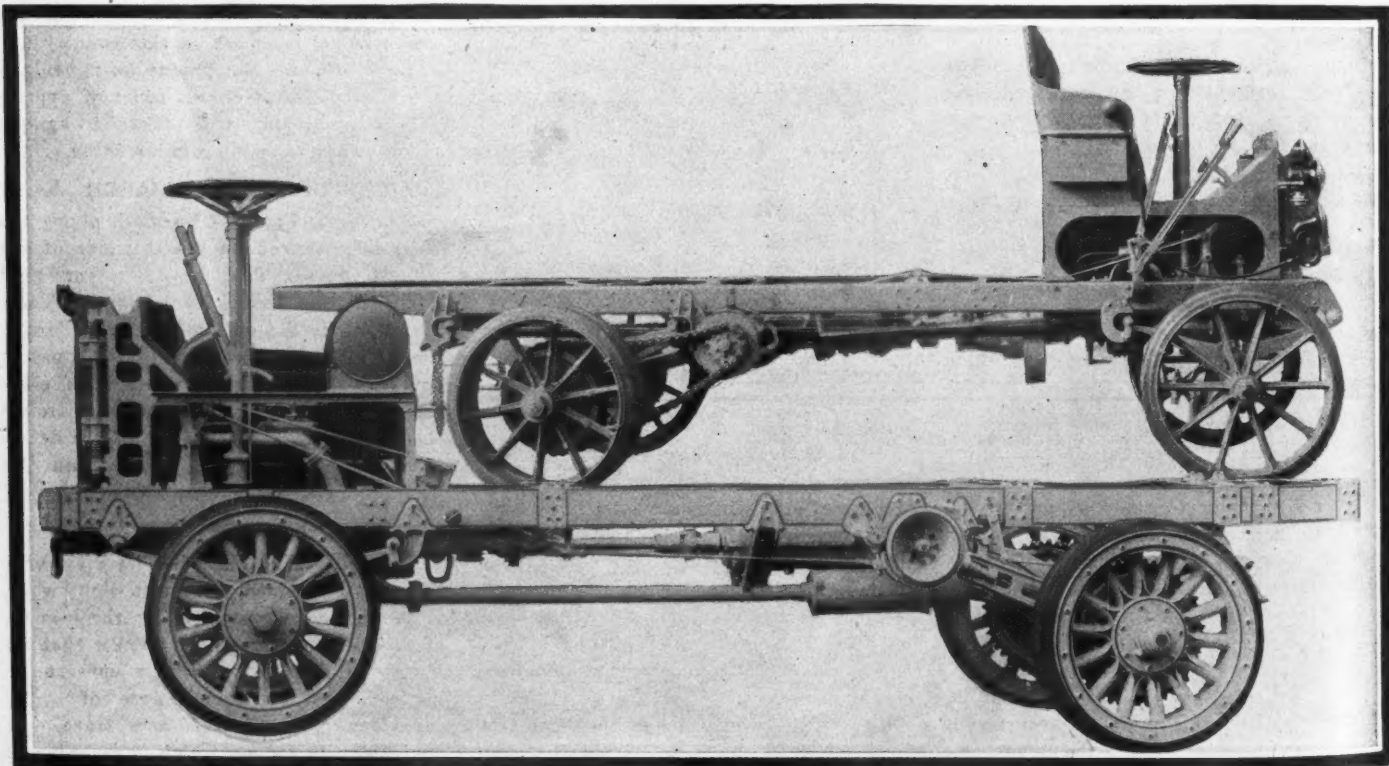
CHICAGO, Feb. 6—The trend in gasoline commercial vehicle construction as indicated by statistics taken from nearly 300 different models reveals many interesting tendencies, while an examination of nearly 200 chassis models now on exhibition at the Chicago commercial vehicle exhibition shows many noteworthy examples of these tendencies.

In motors, for instance, 2 per cent of 300 models now on the market in this

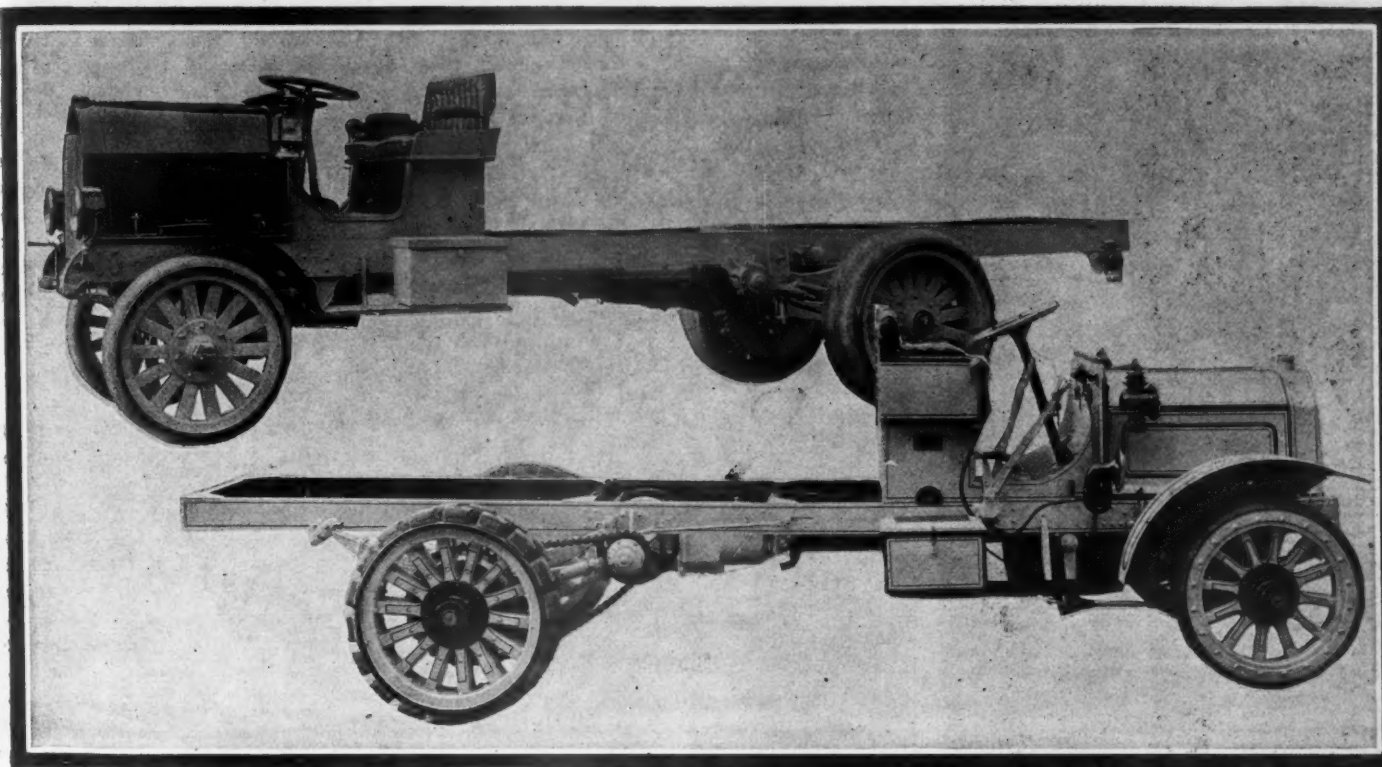
country has one-cylinder motors, 13 per cent has two-cylinder motors, most of which are double opposed mounted horizontally, though several are of vertical design; 4 per cent of the number is of the three-cylinder type, 80 per cent four-cylinder and about 1 per cent six-cylinder motors. The White insurance truck is the only six-cylinder commercial vehicle on exhibition in Chicago.

About 6 per cent of the motors used in

commercial vehicles is of the two-cycle type. In the 1,000-pound class there are seven two-cycle models, in the 1,500-pound class five two-cycle models are to be found, whilst in the 2,000-pound class there are four. The Chase is about the only two-cycle motor in the 3,000-pound class, the Atlas, the only one in the 4,000-pound class, and above the 4,000-pound-carrying-capacity class no two-cycle engines are used. Among the two-cycle mo-



CHASSIS OF 5-TON LOCOMOBILE WITH METAL WHEELS AT TOP AND THAT OF DURABLE DAYTON UNDERNEATH



THE STANDARD KISSEL CHASSIS IS SHOWN AT THE TOP AND THE PEERLESS BELOW

tors, besides those mentioned, there are those employed by the Elmore, Hatfield, Bessemer, Sandford-Herbert, Buckeye, Brooks-Lotta, Duryea, Despatch, Ideal, Motor Wagon, Coleman, Kearns, Veerac and Automobile Mfg. Engine companies.

As to the different types of cylinders employed in the four-cycle motors 64 per cent is of the L-head design; 24 per cent T-type; and 12 per cent, valve-in-the-head designs.

Many En Bloc Motors

It is interesting to note that 34 per cent of all the motors employed has the cylinders cast separately, 45 per cent, in pairs; and 21 per cent, en bloc.

The average horsepower, in the various classes, is as follows: 22.4, in the 1,000-pound class; 23.5, in the 1,500-pound class; 26.3, in the 2,000-pound class; 3,000-pound class, 29.0; 4,000-pound class, 33.8; 5,000 to 6,000 pounds, 39.6; 7,000 to 8,000 pounds, 38.6; 9,000 to 10,000 pounds, 34.3; and over 10,000 pounds, 47.0 horsepower. The average horsepower of the motors employed in the buses is about 33.0.

Though it is possible to use a longer stroke motor to a greater advantage in

the commercial vehicle than in the pleasure car, the average length of the stroke in the commercial vehicle hardly exceeds the bore of the cylinder by an inch, in fact, $\frac{3}{4}$ -inch would be a closer average. There are, however, a number of vehicles whose motors have an exceptionally long stroke as compared with the bore. One of the most exaggerated examples is to be found in the Motor Conveyance Co.'s B. O. E. truck, model A-6. This motor has a carrying capacity of 12,000 pounds and its four-cylinder motor has a $5\frac{1}{4}$ -inch bore and 8-inch stroke. The White model T-C, however, which has a carrying capacity of 10,000 pounds, has a motor with a $4\frac{1}{4}$ -inch bore and a stroke of a little more than $7\frac{1}{2}$ inches; while the General Motor's truck, model V, of 2,000 pounds capacity, has a $3\frac{1}{2}$ -inch bore and a $5\frac{1}{4}$ -inch stroke, and the model S a 4-inch bore and 6-inch stroke.

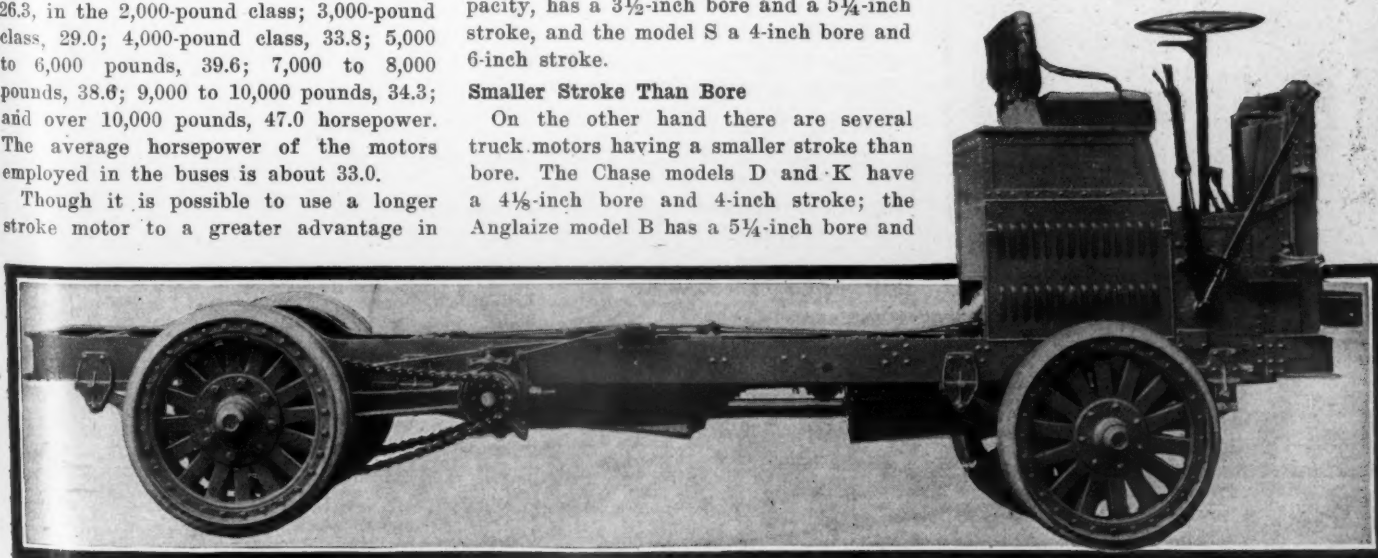
Smaller Stroke Than Bore

On the other hand there are several truck motors having a smaller stroke than bore. The Chase models D and K have a $4\frac{1}{2}$ -inch bore and 4-inch stroke; the Anglaize model B has a $5\frac{1}{4}$ -inch bore and

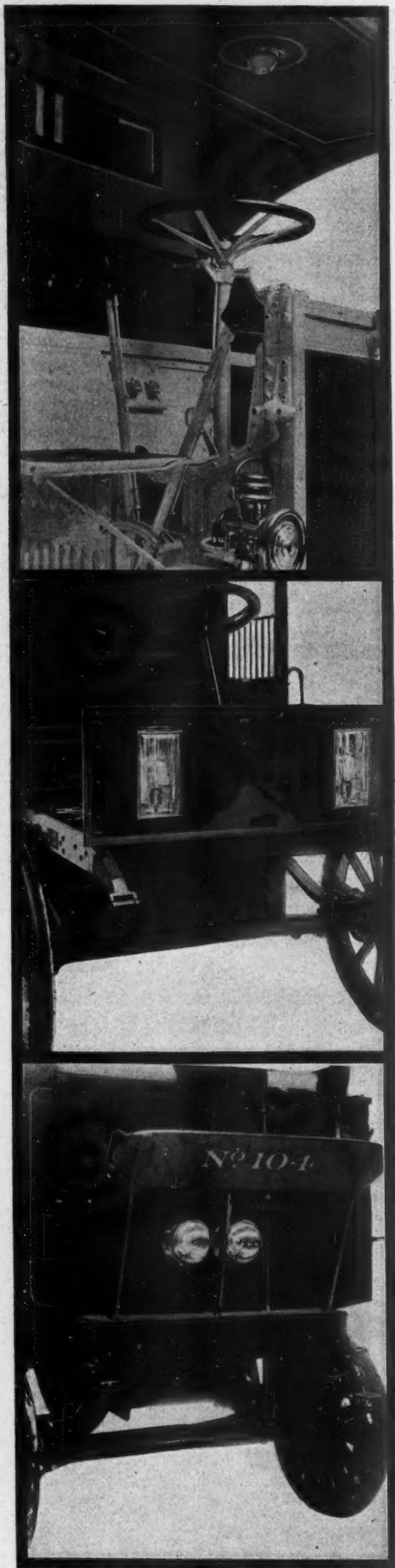
4-inch stroke, and the model L a 5-inch bore and 4-inch stroke; the Anna has a $5\frac{1}{4}$ -inch bore and 4-inch stroke; the Hart-Kraft, a $4\frac{1}{2}$ -inch bore and 4-inch stroke; the Hatfield a $4\frac{1}{8}$ -inch bore and 4-inch stroke; the Knox model R 64 has a 5-inch bore and $4\frac{3}{4}$ -inch stroke, and the Lambert 1,000 pound car also has a motor of this type with a $5\frac{1}{4}$ -inch bore and $4\frac{1}{4}$ -inch stroke; and there are others in this category.

Half of Cars Have Subframes

It might safely be said that 58 per cent of all the motors employed is mounted on subframes, and 26 per cent by three-point suspension from the main frame; while 16 per cent might be said to be mounted direct from the main frame by



NEW 5-TON RELIANCE CHASSIS WITH VERY LOW FRAME AND ARCHED SIDE MEMBERS



RELIANCE OVERHEAD CAB LIGHT
GENERAL VEHICLE DASH LAMPS.
PROTECTING LAMPS WHICH ARE USED
IN G. V. TRUCKS

four-point suspension. The subject of motor suspension has been considered rather a serious one with the commercial vehicle manufacturer and as a result a number of ingenious schemes are to be seen through which the designers have endeavored to eliminate as much of the road vibration as possible from the motor, and to protect it from strains due to possible twisting or misalignment of the main frame on uneven roads.

Unique Subframe Constructions

In the Lozier car the radiator, the driver's seat, the motor and the gearset, all are mounted on a subframe which is pivoted at two points on a cross member of the main frame at the rear while two semi-elliptic springs, one on either side, support it at the front. These springs bear on the inside of the lower horizontal portion of the main-frame side members. The Sampson and one or two other makers are using practically the same scheme. The motor of the Gramm truck is mounted on a subframe which is suspended from the main frame by three-point suspension; a pivot being provided at the front end and two pivots, one on either side, at the rear end. The Blair worm-drive truck has an unusually long subframe that supports the motor and transmission gearset, and propeller shaft as well. This frame is pivoted on the rear axle and suspended from a cross member of the main frame at the front, on two coil springs. This construction brings about an absolutely straight-line drive from the motor to the rear axle at all times, and should form a very suitable support for the motor and transmission mechanism.

The location of the motor varies consistently in the different classes, though generally speaking in about 55 per cent of all the vehicles the motors are located in the front of the car under a hood as in the standard passenger car construction; and in 42 per cent, the motors are arranged under the body; while in 3 per cent the motor is in front or centrally arranged in front of the front seat with the seats divided so the operator may sit on one side of the motor and the extra passenger on the other side.

Regarding Motor Location

There is no doubt but that the arrangement of the motor under the hood is, in the majority of cases, the better one from a point of accessibility, but still the number of the makers who have arranged their motors under the cab have succeeded in rendering their motors most accessible; and even more accessible, in fact, than several of those whose motors are arranged under the hood. In the Speedwell for instance, the cab is secured to the frame by two hinges on either side. The hinge-pins of these hinges may be removed very readily so that by removing two pins on one side the cab can be tipped up in a manner that renders the motor just as accessible as if it was under the

hood; and if all of the hinge pins are removed the entire cab or seat can be taken off of the car so that easy access to all parts of the motor is obtainable.

The Most Accessible Motors

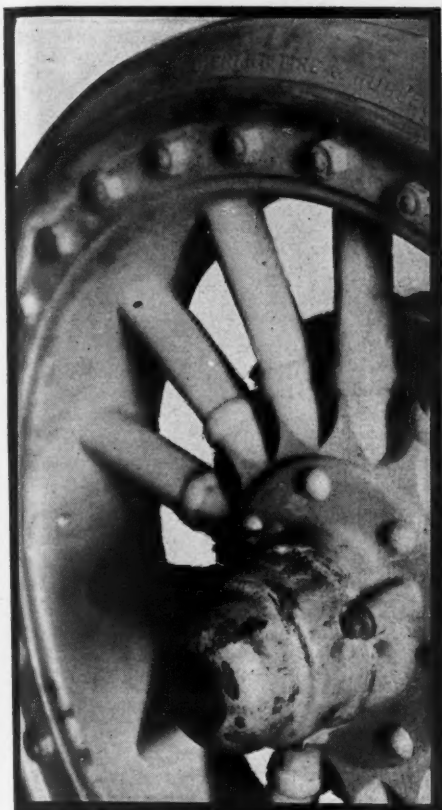
As for the motors contained under the hood the most accessible are those whose radiators are arranged at the rear or incorporated in the dash, so to speak, as in the Renault cars. The Adams and the L. A. W. motor trucks are two examples of commercial vehicles having a radiator behind the motor, and in these cars one has but to lift up the hood to obtain easy access to all parts of the motor. The location of the magneto in these cars is most convenient, it being mounted on a cross shaft at the front end of the motor.

It might be interesting to note that 108 of the 300 commercial vehicle models listed have governors, which are designed to automatically hold the speed of the truck down to reasonable limits. These governors, in practically all cases are of the centrifugal type and operate the butterfly valve of the carbureter. In operation, when the motor reaches a pre-determined speed, the governor automatically tends to close the butterfly valve of the carbureter, cutting down the gas supply to such an extent that a greater motor speed cannot be obtained. These governors are so adjusted that the speed of a vehicle in the 2,000-pound class might be limited to about 18 miles an hour, a 4,000-pound class vehicle, 15 miles an hour, and a 6,000-pound vehicle about 12 miles an hour. These speeds, however, vary slightly on the different makes. On the large Sampson trucks the speed is limited to 9 miles an hour, which is equivalent to about 900 revolutions of the motor. The Harder 2-ton truck is limited to 15 miles an hour and the 3-ton to 14 miles an hour, whilst the Saurer 6½-ton truck is limited to 10 miles an hour, and the 4-ton to 13 miles an hour.

But Few Air-Cooled Models

Only 8 per cent of practically all of the commercial vehicle models is air-cooled and practically 7 per cent of them are cars having a carrying capacity of 2,000 pounds or less. The Kelly truck and the Franklin bus are practically the only ones of the heavier type that are air-cooled, and these have a very efficient cooling system of the air-blower design, in which the motor has its cylinders surrounded by air jackets, and a large air blower is provided to circulate air through these jackets.

Vertical tube radiators are by far the most popular in the commercial vehicle. Forty-six per cent of all models has out and out vertical tube radiators, while 31 per cent is listed as having a honeycomb type of radiator, while only 7 per cent has radiators of a cellular type. It is reasonable to believe, however, that only 2 or 3 per cent of all of the models now on the market has genuine cellular radiators; and that those that are listed as honeycombs are in the great majority of cases



ROUND HUB CAP ON DECATUR

really vertical tube radiators of a cellular design; in fact, the only cars seen at the show by the writer that had genuine cellular radiators were the White and the Mack, though it is possible there may have been others.

Spring Radiator Supports

In order to protect the radiators as much as possible from road vibration, 42 per cent of all cars has the radiators mounted by some sort of spring suspension; 3 per cent of the number is to be found mounted on rubber or felt cushions, or on a subframe or cradle to provide protection from strains that might be brought about by contortions of the frame. In 1 per cent of the number the radiators are mounted on trunions, to eliminate torsional strains of the frame. The spring arrangements are to be found in a great variety of designs. Some cars, like the

Packard and the Velie and the Natco, use a single, broad, flat blade spring with scroll ends, which form a cradle so to speak for the radiator, the scrolled ends of the cradle being secured to the side members of the frame.

Radiators Without Fins

The use of the plain copper tubes without fins seems to have been adopted from European practice by three or four makers. Both the A. O. Smith and the Adams truck have radiators of the vertical, plain, copper tube type.

In passing, it might be of interest to mention that 22 per cent of commercial vehicles has thermo-sypho cooling systems, and 56 per cent use a pump to maintain the water circulation.

In the way of ignition the jump spark is almost universally employed, though there are several exponents of the make-and-break type. In 80 per cent of the cars the ignition is controlled by hand, in 16 per cent fixed control is employed, and in 4 per cent it is automatically advanced by means of a governor.

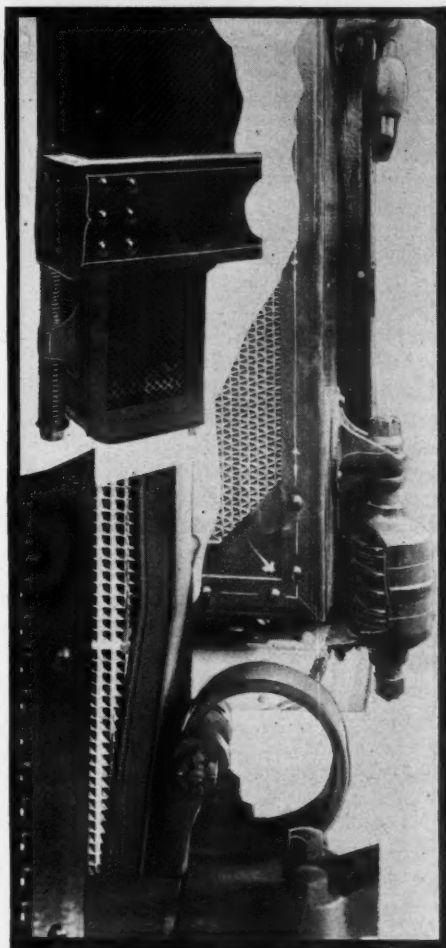
The multiple-disk clutch is by far the most popular, as 53 per cent of all commercial vehicles is so equipped; 25 per cent has cone clutches, and 1 per cent use an expanding band type.

The sliding selective gearset has a long lead in the transmission design, 64 per cent being of this type. There are, however, a great many planetary transmissions in use on the lighter cars, practically 10 per cent of all models being represented as using the planetary transmission; and practically all of these on cars having a carrying capacity of 2,000 pounds or less. Sixty per cent of all transmission gearsets is located amidships, either separately or in unit with the jackshaft, and it might be safe to say that of this number 50 per cent is separate and 50 per cent in unit with the jackshaft. Only 2 per cent of the transmission mechanisms is in unit with the rear axle, and 11 per cent in unit with the motor.

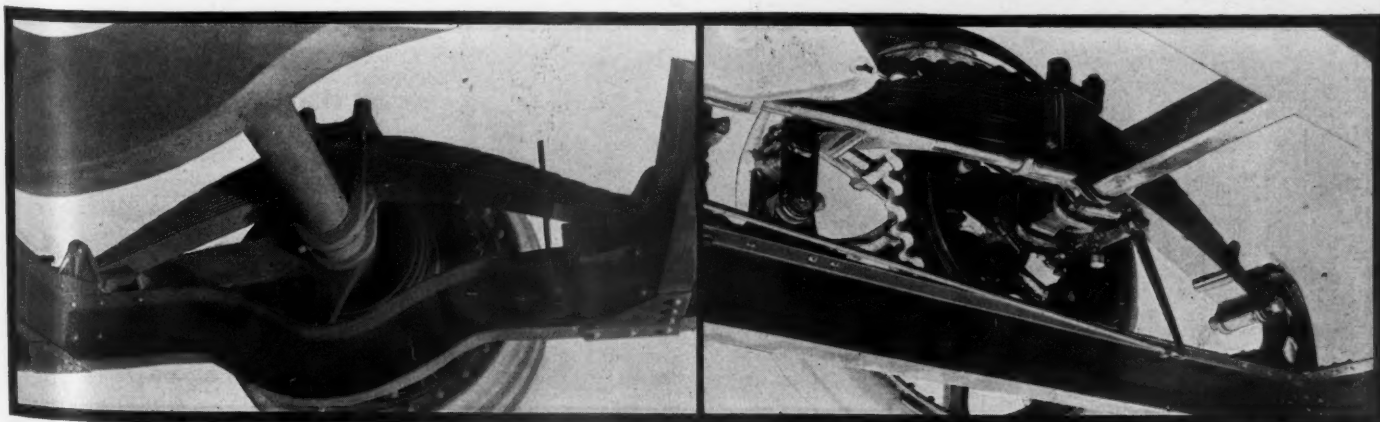
As for the number of forward speeds, 62 per cent is of the three-speed type, 13 per cent gives two forward speeds, 11 per cent four forward speeds, and 4 per cent, which perhaps represents friction-drive types, a greater number of speeds. It is

interesting to note that 9 per cent of the motor trucks this year is equipped with a means of locking the differential mechanism so that the driving power will be transmitted to both of the rear wheels when the lock is secured, thus making it possible to drive the vehicle even though one wheel should rest on a slippery surface that would cause it to lose traction.

A noteworthy feature of truck design this year is the increase in the adoption of the pressed steel frame, which makes both for lightness and strength. Twenty per cent of all vehicles has pressed steel frames, 8 per cent angle iron frames, 53 per cent channel steel, 1 per cent reinforced wood, 2 per cent wood.

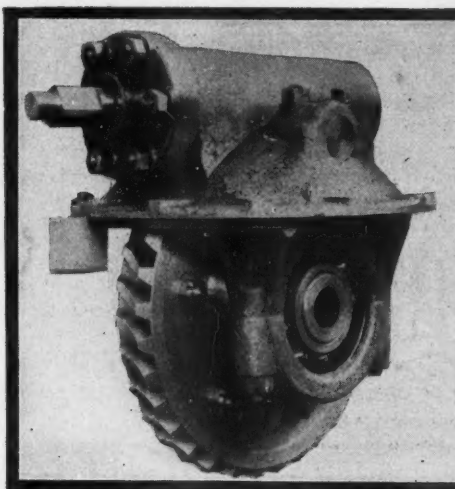


SPRING RADIATOR MOUNTING ON SPEEDWELL AT UPPER LEFT, VELIE AT BOTTOM AND MOGUL AT RIGHT

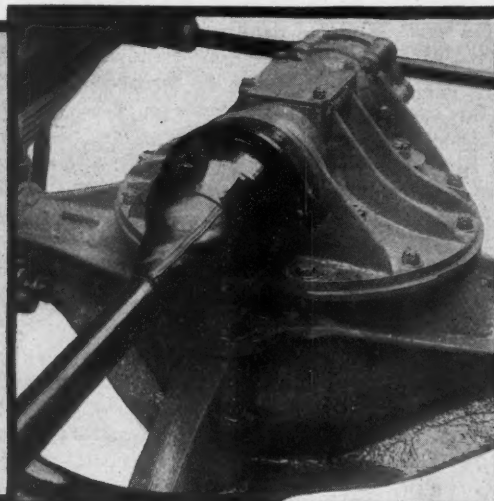


UNDERSLUNG MOUNTING OF WHITE CHASSIS

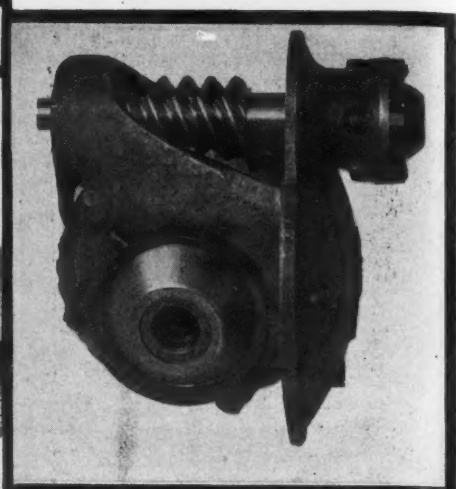
UNDERSLUNG FRAME ON RELIANCE



WORM-DRIVE UNIT OF BENSON CO.



PIERCE-ARROW WORM-DRIVEN REAR AXLE



A. O. SMITH WORM AND WHEEL

WHILE the Pierce was the only worm-drive truck shown last year, five different makes—the Pierce, Dain, Blair, Stegeman and the A. O. Smith—are exhibited at the 1912 show, while the Benson Gear Co. is showing a worm-drive axle. While the percentage of cars using the worm drive at present is comparatively small, yet no feature of truck constructions is more discussed, or attaining a greater degree of interest than this form of final drive. Of the trucks exhibiting the drive, two import the worm and gear from England.

Two types of worm and worm wheel predominate. These are the Hindley and the Lanchester designs. The former type is used by Dain and Blair, while A. O. Smith uses the Lanchester. Pierce has a worm which was brought out several years ago, and while it resembles foreign practice, it is an original design. In its construction there are thirty-nine teeth on the worm wheel, while the worm has five threads. The pitch used is 5.15-16 and the end thrust is taken by a double-row thrust bearing. Annular bearings on either side of the worm wheel carry the shaft.

Similar to the Pierce, the Dain is demountable from the top. This latter as well as the A. O. Smith has a three-thread

Worm Drive at Show Five Different Makes Are Fitted With the Device

worm. The A. O. Smith worm and wheel are removable in their entirety and are carried in a separate casting which is housed within the shaft housing. The Blair construction makes use of four threads on the worm, and the angle is 28 degrees. The A. O. Smith also has a 28-degree angle. In the Blair type are four separate and distinct bearings, one thrust and one annular bearing being placed on either side of the worm wheel. Unlike the others, this worm and wheel is demountable from the rear by the removal of two holding bolts and eight housing bolts.

There has been a claim amongst those who are not using the worm drive as to inefficiency in transmission and yet the makers of these gears are claiming an efficiency of 95 per cent by actual test. Whether this were true or not, gears used so far have proven the practicability of this drive and its silence is unquestioned. A Pierce truck loaded with 6 tons of coal traveling over a cobblestone pavement at 12 miles an hour was recently noticed

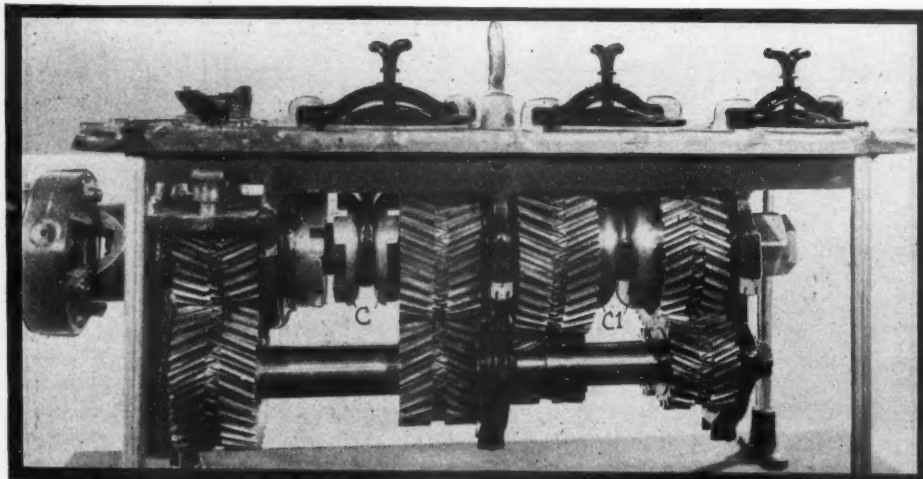
making so little noise, even at this speed and with full load, that it was not heard until directly opposite and but 20 feet away in spite of the fact that there were but few other vehicles about at the time to drown the noise of the truck's passing. Silence is something to be sought for even if at a small loss of efficiency. If properly lubricated and properly generated, the life of a worm compares very favorably with that of a bevel gear of the same capacity and the percentage of gain this year over last in its use is certainly an indication of a tendency.

The method used by the A. O. Smith Co. in housing its worm at the rear is very interesting, making for great accessibility and quickness of repair. On removing the plate at the back of the rear axle housing the worm, with its gear and differential and all bearings complete, comes off with the plate as illustrated, all of this part being in unit, so that in examining the drive at any time no adjustments are disturbed and everything is accessible.

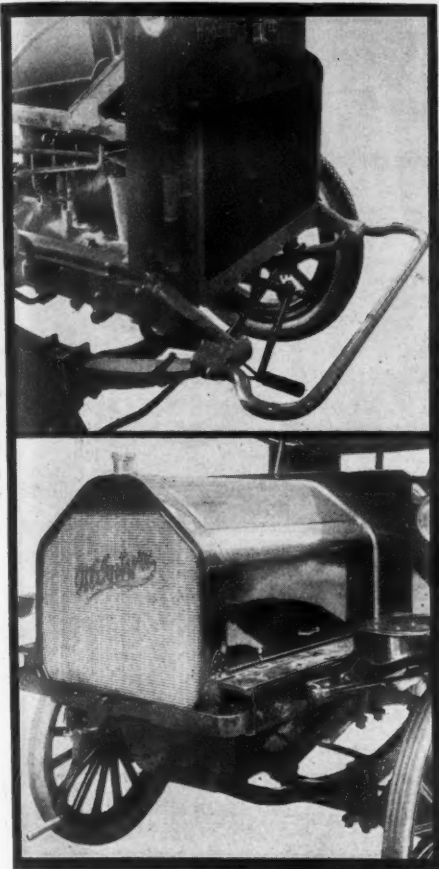
The Dain friction-drive truck uses a unit power plant with the rear torsion tube running back to the worm housing as a part of the unit. The motor is hung on two shackles, the third point of suspension being the rear axle, so that a straight drive is obtained. The worm itself is made by the Otis Elevator Co. This car drives direct on high, the drive wheel fitting into the flywheel as a clutch. The friction part of the drive operates only on low and reverse.

The Blair mounts the motor, change-speed set, etc., on a subframe, which frame is supported through two points at the front on either side of the motor, and at the rear axle on one point. Proper provision is made for the twist of the road shocks on this frame by its method of support on the rear axle.

The Benson worm-driven axle is fitted with a Hindley type of worm pivoted in the housing on either side to allow the worm to adjust itself to any unequal distribution of load which conditions may bring about.



INDIVIDUAL-CLUTCH, C AND C1, HERRINGBONE GEARSET ON SMITH TRUCK



RADIATOR PROTECTORS USED ON DECATUR AND MCINTYRE TRUCKS

Truck Chain Guards

Clever Schemes Utilized to Protect Drive from Dirt

BY inclosing the drive chains of a truck in a dirt-proof housing or guard, the life of the chain can be increased 100 per cent. The making of an efficient chain guard, however, is more of a problem than would at first appear, as those makers now using them know. In the first case the guard must be water-tight so that sand and dirt will not be driven into the case during the washing periods at night, and, mixing with the grease or oil in the guard, make a fine grinding compound. At the same time a number of moving joints must be fitted, the guard hinging at either end around rear axle and jackshaft and at the same time having provision for side movement under conditions such as when one rear wheel mounts an obstruction which the other one misses.

At the same time—and this is taken account of in few chain guard designs—in swinging a corner sharply when the body is fully loaded there is a certain side swing to the springs allowing the whole frame above the springs to swing out. If some provision is not made for this the guards will have to take all the centrifugal strain of the body and load when turning. An extra strain will loosen up or break guards which are not designed to take it.

Taking all these things into account the

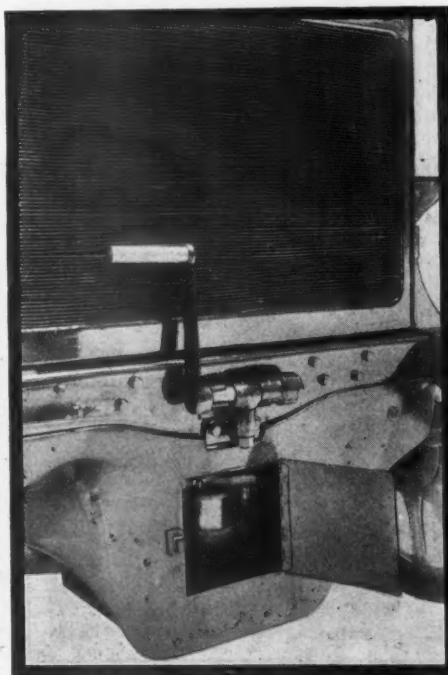
chain guards shown on this year's trucks are an improvement over former devices, more refined and more oil and waterproof.

The Sampson truck was one of the first fitted with chain guards, which type has been very successful, being similar in basis of design to other makes. This guard, made up of sheet steel, acts both as a guard and a radius rod. It pivots at the rear axle on a plain bearing, the same being true on the jackshaft end, except that there is in combination a ball-and-socket joint at this end allowing for the side twisting of the guard in any direction demanded by the level of the rear axle. This guard is fitted with a quick removable cover and has, as well, a sheet steel inspection door in the front.

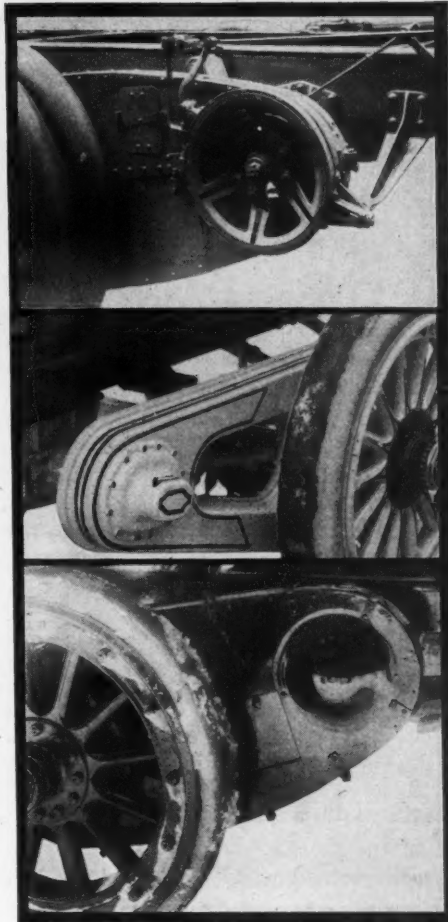
The Lozier chain guard has many features similar to the Sampson, but goes a step further in fitting the jackshaft brake outside in a very neat fashion. The Sandusky guard is cast of aluminum, having the central part of the guard fitted with an opening as shown in the illustration, allowing a very accessible adjustment of the radius rods behind, for in this car none of the radius strain comes on the guards. This guard is claimed to be absolutely oil and waterproof and is packed with hard grease.

The Stegeman chain guard has the back plate forming the radius, of cast iron, and the front of cast aluminum, a neat arrangement making for great strength. This has also a ball-and-socket joint at the jackshaft end. The Cartercar and Natco guards are of standard sheet steel construction. The chain guard on the Commer truck is of cast iron and very substantial, as is necessary on a truck of the size to which it is fitted.

Altogether all the chain guards shown have a better and more practical look than previous designs.



ACCESSIBLE CARUERETER LOCATION ON U. S. MOTORS



CHAIN CASES OF LOZIER, SANDUSKY AND SAMPSON TRUCKS

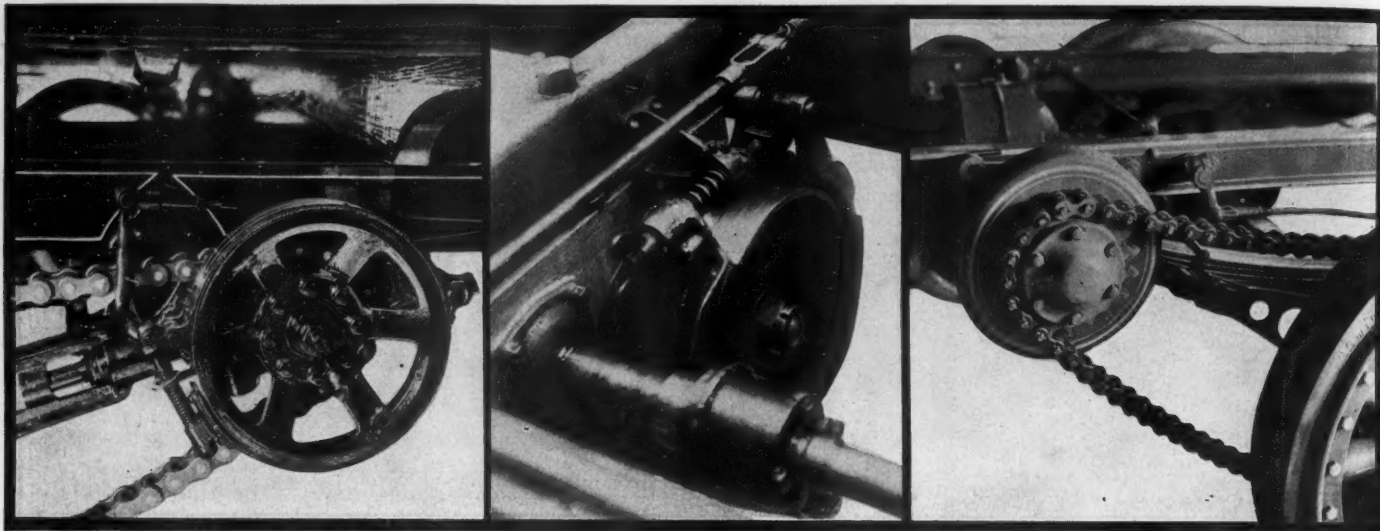
Radiator Protection

Truck Makers Find Means of Safeguarding Cooling Device

SIXTY per cent of the motor trucks exhibited has some form of radiator protection. Some fit a real fender at the front, spring-supported; others utilize the front cross member of the frame as a buffer or fit to it a wooden bumper; while others run a bar across the front of the radiator, or a heavy steel wire screen.

The Alco has a heavy wooden bumper of very substantial appearance bolted to the front member of the frame, as have also the Packard and Kelly. The G. M. C. has a 1-inch bar bolted across the radiator front, from either side, while the Pierce fits a heavy piece of tubing across the front below, held on brackets extending out a foot beyond the radiator from the spring horns. The White has a round bar fitted in a somewhat similar manner.

On the McIntyre a piece of angle iron is bent around in front to act as a protection and also to hold the bracket for the starting crank. The Federal, Jeffery, Locomobile and others fit the radiator between the frame back of the front cross member, allowing this piece to act as a protection. This in the Mack and Atterbury is curved out in front. It is little things in design that make for refinement continued service with few stops.



INTERNAL EXPANDING JACKSHAFT BRAKE

GARFORD GEARSET SERVICE BRAKE

FEDERAL EXTERNAL JACKSHAFT BRAKE

THE matter of service brakes is receiving a large amount of attention from the makers, many fitting jackshaft brakes on account of accessibility while the Garford fits the brake on a drum at the front end of the transmission, this being of the external contracting type, the band flanged for cooling and stiffening.

Of the jackshaft types there are two constructions, constricting or expanding, shown in three locations, at end of jackshaft, between sprocket and frame or inside frame. The one predominating is the external contracting band type fitted outside for greater accessibility. This type is fitted to the Lozier, Diamond T., Mogul, Dorris, U. S., Dayton, Locomobile, and several of the smaller makes.

The jackshaft band type fitted inside the sprocket, or between the sprocket and the frame, is used by the Harder, Gramm, Packard, Knox and others. The Peerless, Kissel and Alco use contracting band brakes on the jackshaft inside the frame, under the body.

Internal expanding jackshaft brakes are used in a number of makes, the Stearns

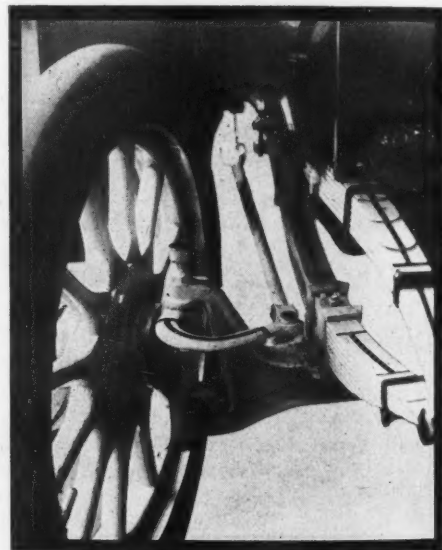
Jackshaft Brakes as Found on Trucks

fitting them outside the sprockets, on the ends of the jackshafts, and the McIntyre, for instance, inside. Each type of brake has its own talking features, advantages and disadvantages, but all types seem to be working out well in service. The Sampson firm in its big trucks fits a brake on the drive shaft between the transmission and jackshaft housing.

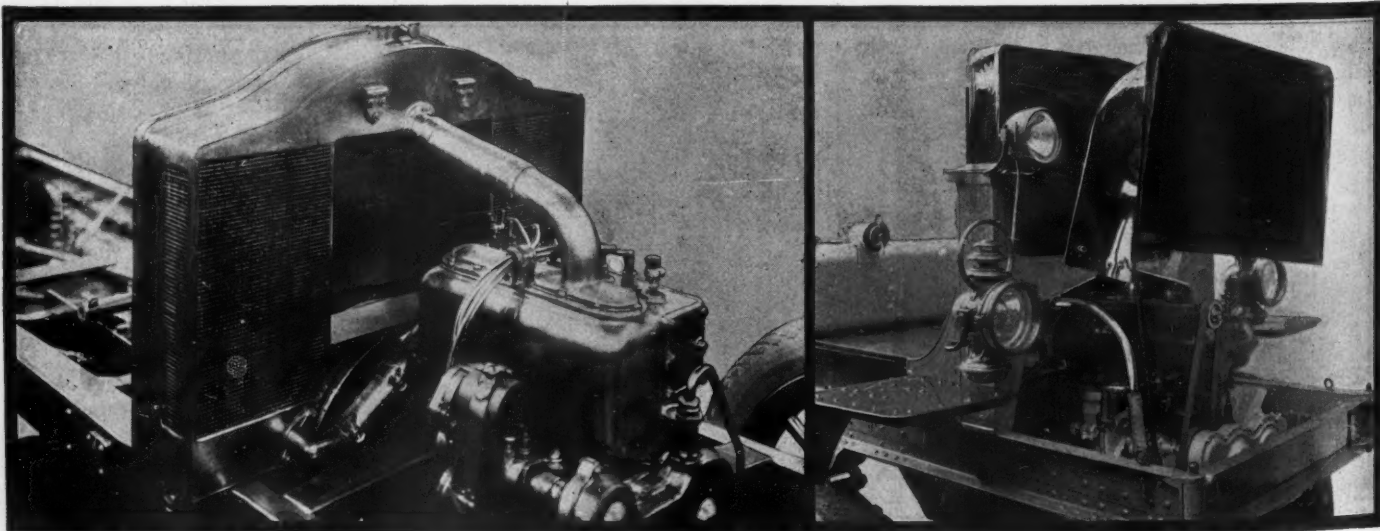
The Saurer truck has a very interesting compressed-air proposition for a service brake worked by the throttle lever. For a quarter of the circle this lever works the throttle but, beyond the closed position, causes the motor to two cycle, compressing air in the cylinders to an extent which enables the car to be controlled on a 20 per cent grade without the need of a foot brake. A somewhat similar scheme is used on Swiss mountain locomotives and there seems to be no reason why it should not work out well on a truck.

There is some tendency to reverse the accepted location of the emergency and service brakes in truck constructions, that

is, to put the service brake on the rear axle and the emergency brake on the jackshaft.

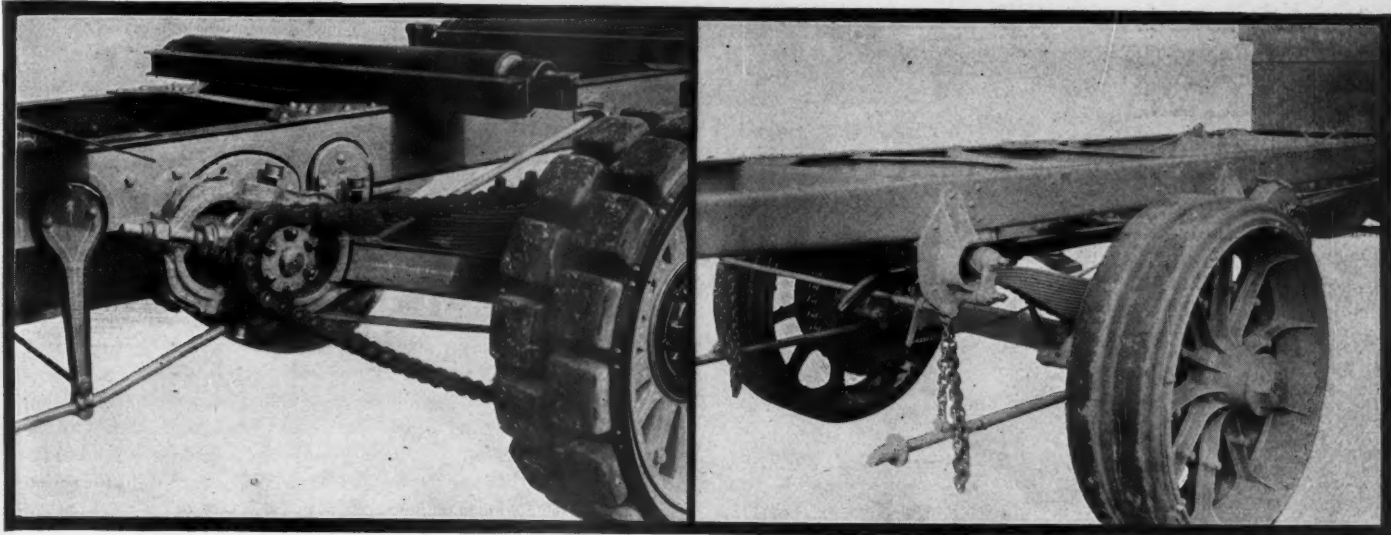


BUICK SEVEN-EIGHTHS FRONT SPRING



LIPPARD-STEWART MOTOR PARTLY HOUSED UNDER RADIATOR

RADIATOR PLACED BACK OF GRABOWSKY MOTOR



MOGUL TRUCK WITH ROLLERS FOR QUICK BODY LOADING

SPRAG AND REAR SPRING ON 5-TON LOCOMOBILE

Making Empty Motor Trucks Ride Easy

WITH the increase in the size of trucks there have been some very rational schemes devised to make them

ride easier when running light, as well as to take care of road conditions under full load. This has been accomplished in most cases by an auxiliary spring, generally placed crosswise over the rear axle, made fairly stiff and short, and coming into action only when a heavy load is on the truck.

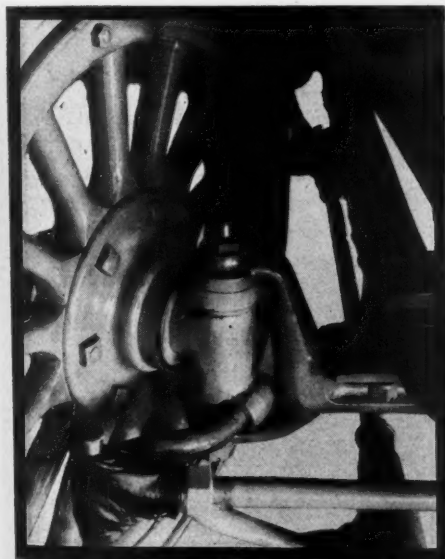
These auxiliary cross springs are found at the Chicago show on the United States, Dorris, G. M. C. 2-ton, Gramm, Mack, Garford, McIntyre, Sternberg and White, in the Coliseum; as well as on several of the larger trucks in the armory.

The Grabowsky uses a somewhat different arrangement, making the rear cross spring of their platform type construction light enough for easy springing when the body is empty. When loaded full, bumpers shift the load from this spring to the main heavy springs so that they take all the strain beyond a certain point, thus saving the light spring from overload and unnecessary strains.

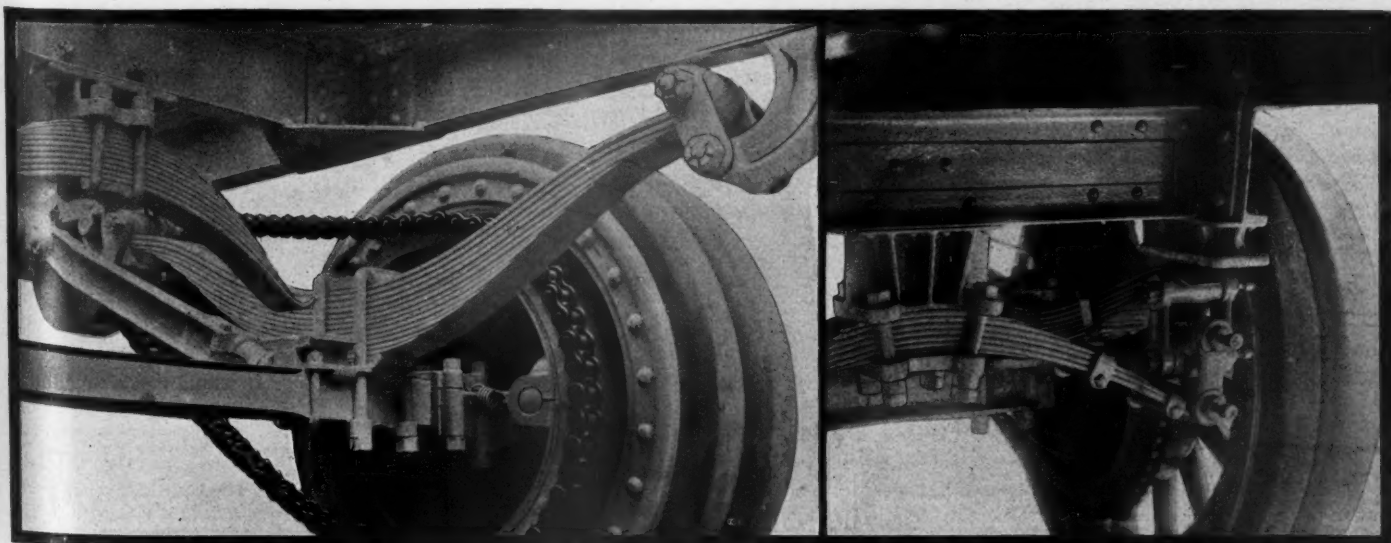
Two of the trucks shown have the rear

springs underslung, this being seen on the White and the Reliance. In the latter case the frame is curved above the axle to allow for plenty of spring play. These constructions are interesting in showing a tendency toward lowering the center of gravity of trucks. On account of the necessity of the modern wide bodies extending out over the wheels making for high platforms, there is much space under a truck, in many cases, which might well be utilized in lower constructions to give greater stability and less liability to skidding. The underslung spring construction is but one way of working out of the low weight idea. One of the best schemes to lower the frame and yet have adequate spring action is in the 6-5-ton Saurer, in which the side members of the frame are offset, opposite the rear wheels, for the entire length of the semi-elliptic rear springs.

On the Gramm and Speedwell trucks the auxiliary cross springs are so placed that they come into contact only when the load reaches a certain weight. Then, when the truck is carrying a heavy load, the cross springs assist the side springs.



ATTERBURY STEERING KNUCKLE



SPEEDWELL AUXILIARY CROSS SPRING

GRABOWSKY CROSS SPRING CONSTRUCTION



MOTOR AGE

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Progress in Motor Trucks

THE present motor truck show in progress in Chicago as well as the two truck displays recently held in New York have all shown how varied and pronounced has been the progress by these manufacturing concerns during the past year. Numerically concerned, the truck industry is attaining enormous proportions. Over a dozen big companies have entered the field within the last year, to say nothing about more than a score of smaller companies and several new builders of large trucks. The crop of new vehicles ranges from the smallest to the largest. Several of the old line companies have entered the field with 5-ton vehicles, but have announced that they are already working on 3-ton types, which they will market within the next 6 months. Companies that have been in the market for several years with but a single model have been forced to enlarge their line during the past 12 months. One big company, that built only 3-ton sizes, has added a 2-ton vehicle. Others that built 1, 2 and 3-ton types have added a 5-ton line; others that did not make larger than 5-ton designs have added a 6.5 and a 7, and some companies now boast of having a complete line ranging from 1 to 10 tons capacity.

VIEWED from a mechanical point of view, the progress of the year has not been any less important. There has been very much improvement. The experience of the year has taught many never-to-be-forgotten lessons. These lessons have been in nearly every department of the truck. One concern did not have its brakes large enough; they have been increased in drum diameter and width. A second did not have sufficient radiator capacity for slow work in hot, summer weather; the water tank has been added to. A third found that its governor was practically useless unless all of the connections were entirely enclosed in metal tubing and sealed; this has been done and now it is impossible for the driver to meddle with this important bulldog to look after the interests of the truck owner. A fourth has found that he must fit very heavy hub caps and that these must have plain semi-spherical ends; this has been done and the hub cap secured with heavy bolts, so that the danger of being torn off by striking on door frames has been eliminated. With a fifth company experience has shown that the road wheels were too light, the spokes too weak close to the inside of the felloe and now these are very strong. A sixth had too light a frame and now each side member is stiffened with truss rods. A seventh had springs too stiff for the empty trucks and scarcely adequate for an overload; by using a combination scheme, a weak set carries the empty vehicle and a secondary heavy set takes the load. Examples could be cited by the score telling what the truck maker has done to improve his vehicle.

LOOKING over the score or more of new trucks, trucks never seen at a Chicago show before, it is a pleasure to see that the old idea of converting a pleasure car into a truck has almost died. There are very few examples of this today. One or two are seen, but their days are numbered. The buyer is very quick to spot such constructions. It can be truthfully said that nearly all of the large-capacity new trucks have motors that are not pleasure car types, but designs specially intended for truck service. Often the company has not changed the cylinder dimensions very much, but has added a much heavier crankshaft, has used five bearings instead of

three, and has made the crankcase heavier. The gearset has been redesigned, with wider face gears, heavier shafts and shorter distance between bearings. The necessity for a stouter gearbox to withstand vibration caused by solid rubber tires and stiff springs has led to the necessity of much heavier castings and in some bronze is used instead of aluminum and not a few employ cast iron. Strength is essential, a fact that many engineers have realized.

THE subject of vibration suggests the supporting of the motor on a subframe with spring support, these springs absorbing much of the chassis vibration. Last year two concerns used this and there has only been one addition to the ranks within the year. At that time it was thought that many would follow this example. When discussing it makers take little stock in the effect of vibration on the motor. It is made strong enough for such service; that is one reason why the motor of the pleasure car is not well suited for the work, except in one or two cases where the motor was originally designed for both pleasure car and commercial service, the motor being stronger than really needed for the pleasure car.

THE progress in bodies is most apparent within the past season. The new steel body is coming into vogue. Electric welding has eliminated the external rivet heads, and now the exterior of a brewery or coal wagon has as smooth a surface as the piano in the parlor. This use of electric welding is also seen in some fine examples of stake trucks, each stake being a hollow tube, with cross tubes electrically welded in position. Up to the present time such excellent construction was not dreamed of, but, thanks to the car, the ideas of the horse regime are being displaced by modern ones, and no longer will brewery people be troubled with the rotting wood stake, the imperishable steel one has taken its place.

HAND in hand with improvement in bodies is the improvement in the driver's cab. Two years ago the motor truck did not have the driver's cab. He was forced to stand all kinds of weather, but in the last couple of seasons the pleasure car builder has provided an enclosed compartment in the limousine for the chauffeur and now the truck maker is following his example. Nearly every truck has some kind of driver's cab. Some are perfect enclosures, with rain-vision wind shields, side curtains or doors. In some lockers for extra clothing are provided. In a word, the driver's cab has come to stay. It is a modern idea. The driver can work better if kept dry than if forced to sit out exposed to the driving rainstorm. A good cab is a business investment; it is but another example of the real revolution that the motor vehicle is accomplishing.

MUCH effort has been expended in introducing time saving factors in different trucks. This idea was launched several seasons ago when the rapidly demountable motor was introduced. This is still with us but has gained only a very few adherents within the last couple of seasons. One way in which time has been saved is in the use of the demountable dual solid rubber tire. The days are nearly over when it is necessary to send a truck wheel to the factory simply because a tire has come off. With the demountable idea much time and also money have been saved.

Big Monaco Rally Really a Road Race

PARIS, Jan. 28—With a view to attracting visitors to its favored principality, the authorities of Monaco organized a rally, open to all classes of motor cars. Officially, the competitors had to start from various European cities—Paris, Vienna, St. Petersburg, Berlin, Havre, Boulogne, Brussels, Amsterdam, Geneva and reach Monte Carlo at an average speed of not less than 15½ miles an hour, all stops included. If they attained this average they secured the maximum number of points, 15, under regularity heading; but were not awarded additional points for a higher average. For every 100 kilometers covered 1 point was awarded, for each person comfortably carried 2 points were given and points not exceeding 10 were accorded for the state of the chassis and the elegance of the bodywork.

Officially it was an amateur go-as-you-like touring competition, but in reality it was a race pure and simple among high-class, completely equipped touring cars. Thus, when the officials of the Automobile Club of France gave the start of the twenty-two competitors from Paris at 8 a. m., there was a wild rush southward. Several of the competitors had arranged to run right through to Monaco, a distance

Cars from Various European Cities Make Run to Celebrated Winter Resort

of 634 miles, without a stop except for food. Road accidents made this impossible for some of them, but one competitor, Robert Dononcin, in a 40 horsepower Gobron, ran right through the night, reaching the finishing point at 8:41 the next morning, having averaged 25½ miles an hour for the full distance. Incidentally this is only about 40 minutes slower than the limited express train from Paris to Monte Carlo.

Henry Rougier, formerly a race driver with Dietrich, made a fast run with an inside steering double coupe Turcat-Mery. He was one of the first to reach Lyons, 300 miles from Paris, after a non-stop run. Soon after leaving this town a Mercedes, which was a little ahead, caused an accident and the villagers prepared a hostile demonstration. To avoid the crowd Rougier made a detour, with the result that he reached Avignon 5 minutes after the closing of the control, and was obliged to spend the night in that town, the time so spent being counted as running time, thus bringing his average down to 22.6

miles an hour. Among the Paris contingent was one inside-steering Ford car which found itself without a driver at the last moment. Another man was ordered to come from Brussels and was able to get away with the car at noon, or 4 hours behind his official time. The American car reached Lyons at 10 o'clock after having run for 5 hours with headlights. The following morning it set out again, spending a day and half the night on the road, finishing with an average speed of 16 miles an hour, night stops included. This gave it a clean score under the speed regulation. The only other American car to take part in the run was an E-M-F, which came from Vienna, a distance of 818 miles, at an average of 10 miles an hour.

Obviously the fastest times could not be made by the competitors travelling the greatest distance, and the highest averages were recorded by the cars coming from Geneva, a distance of 416 miles. A 12-horsepower Schneider put up a speed of 31 miles an hour, including the stoppage at the customs station; a 33-horsepower Berliet averaged 29 miles an hour; and a 12-horsepower Schneider and an 80-horsepower Cottin Desgouttes each averaged 24¾ miles an hour. Fifty-eight cars out of about sixty-six starters finished.

January 27-February 10—Annual show, Pittsburgh, Pa.; Automobile Show Dealers' Association of Pittsburgh. Pleasure cars.

FEBRUARY

February 3-10—Show at Harrisburg, Pa.
February 3-10—Show at Montreal, Canada; Automobile Club of Canada.
February 5-8—Show at Lima, O.
February 5-10—Show of Automobile Dealers' Association of Wilkes-Barre; R. A. Rosenkrans, 37 West Market street, Wilkes-Barre, Pa., secretary.
February 5-10—Annual show Automobile Dealers' Association, Bangor, Me.
February 5-17—Annual exhibit, St. Louis; F. W. Payne, manager, St. Louis, Mo. Pleasure cars, 5-10; commercials, 12-17.
February 6-10—Show at Lynn, Mass.
February 8-10—First show, Brockton, Mass.
February 7-9—Show at London, Ont.
February 10-17—Show at Atlanta, Ga., of Atlanta Automobile and Accessory Dealers' Association; Homer C. George, manager.
February 10-17—Fall River, Mass., second annual show; D. D. Corbett, manager.
February 12-17—Show at Troy, N. Y.

Kansas City

February 12-17—Show at Kansas City, Mo.; Wallace J. Terry, manager, 302 Long building, Kansas City, Mo.
February 12-17—Show at St. Paul; St. Paul Motor Car Dealers' Association; W. R. Wilmet, manager.
February 12-19—Dayton, O., show; Elmer C. Redelle, manager, Dayton, O.
February 12-19—Show at Ottawa, Ont., Ottawa Valley Motor Car Association.
February 13-17—Show at Grand Rapids, Mich.
February 14-16—First show, Fort Dodge, Iowa.

Pittsburgh

February 17-24—Pittsburgh show; Pittsburgh Automobile Show Association, T. I. Cochran, manager, Pittsburgh, Pa.
February 17-24—Show at Newark, N. J.; New Jersey Automobile Exhibition Co.
February 17-24—Cleveland show; Cleveland Automobile Show Co., F. H. Caley, manager, Cleveland, O.

Coming Motor Events

Minneapolis

February 17-24—Minneapolis show; Minneapolis Automobile Show Association; H. E. Pence, manager, Minneapolis, Minn.
February 18-24—Annual show Portland Automobile Dealers' Association, Portland, Maine.
February 19-22—Show of Minneapolis Automobile Dealers' Association, Minneapolis, Minn.
February 19-24—Show at Hartford, Conn.; Automobile Club of Hartford.
February 19-24—Seventh annual show of Omaha Automobile Association, C. G. Powell, manager, Omaha, Neb.

Cincinnati

February 19-25—Annual pleasure car show; Cincinnati Automobile Dealers' Association, E. A. Kruse, secretary, Cincinnati, O.
February 20-24—Show at Binghamton; Automobile Dealers' Association; R. W. Whipple, secretary, Binghamton, N. Y.
February 20-25—Show of Automobile Dealers' and Traders' Association, New Orleans, La.

Baltimore

February 20-28—Annual show, Baltimore, Md.; Baltimore Automobile Dealers' Association.
February 21-28—Toronto show; Canadian National Automobile Association; W. J. Ross, secretary, Toronto, Canada.
February 20-28—Annual show, Baltimore, Md.
February 22-24—Show at Bloomington, Ill.
February 24-27—Taunton, Mass., first annual show; D. D. Corbett, manager.
February 24-March 2—Annual show; Brooklyn Motor Vehicle Dealers' Association, Brooklyn, N. Y.
February 26-29—Annual commercial exhibit; Cincinnati Automobile Dealers' Association, E. A. Kruse, secretary, Cincinnati, Ohio.

February 26-March 2—Show at Paterson, N. J.; Paterson Automobile Trade Association.

February 26-March 2—Second annual show Elmira Automobile Club, L. Blumenstein, manager, Elmira, N. Y.
February 26-March 2—New Haven, Conn., annual show.

February 26-March 2—Show at Sioux City, Ia., of Sioux City Automobile Dealers' Association.

February 26-March 3—Mississippi Valley show, Quincy Automobile Club, Quincy, Ill.; Harry F. Hofer, director.

February 28-March 1—First show New Bedford, Mass.; D. D. Corbett, manager.

February 28-March 2—Annual Davenport show; Woodworth Clum, manager, Commercial Club building, Davenport, Ia.

MARCH

March—Show at Norfolk, Va.
March 2-9—Columbus, O., show; Columbus Automobile Club.

Boston

March 2-9—Pleasure car show, Boston; C. I. Campbell, manager.
March 4-9—Show at Des Moines; C. G. Van Vleet, secretary, Des Moines, Ia.

Denver

March 4-9—Show at Denver; G. A. Wahlgreen, manager, Denver, Colo.
March 4-9—Show at Reading, Pa.
March 4-9—Show at Newark, O.

LOUISVILLE

March 6-9—Fifth annual show at Louisville, Ky.; Louisville Automobile Dealers' Association.

March 6-9—Advertisers' motor show, Tiffin, O.

March 11-16—Show at Cedar Rapids, Ia.; M. P. Beck, manager.

March 12-16—Show at Syracuse, N. Y.; Syracuse Automobile Trade Association; Syracuse, N. Y.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston; C. I. Campbell, manager.

March 25-30—Tent show at Indianapolis, Ind.; Indianapolis Automobile Trade Association.

Chicago Best of All Shows Is Claim

Passenger Car Week Remarkable for Vast Amount of Business Done—Retail Sales Above the Ordinary, While Attendance of Dealers Is Exceptionally Heavy—Exhibitors Declare Themselves Well Satisfied

CHICAGO, Feb. 4—The pleasure car section of the Chicago show came to an end last night after a whirlwind week which was remarkable because of the great amount of business done not only wholesale but retail. In a word it was the best show week the makers of pleasure cars ever experienced, either here or in New York, and when the lights went out at 10:30 last night there wasn't a dissatisfied exhibitor in either of the two big buildings. Order books were well filled, and in addition the list of prospects gathered during the week was far in excess of expectations. It will take at least 2 months for local representatives of the various cars to exhaust their supply of prospects, and if the business aftermath of the show is not a profitable one it will be astonishing.

Attendance at Show

As for the attendance during the week of the pleasure car show, it was not in excess of last year, according to Manager Miles, who, however, did not attempt to go into details as to this attendance. The largest turnout was on Thursday night, and at all times the buildings were crowded. This was particularly noticeable in the morning and afternoon sessions, when the dealers from out of town had the run of the show.

The show closed at 10:30 and a remarkably sensational exit was made. Within 2 hours after the close the Coliseum had been emptied of its pleasure cars, 167 machines being taken out in that time through one door. Last year this exit was made in the same time, but then two doors were used. This almost is a record, for

the cars this time were sent into Wabash avenue, which at that time of night is congested with the theater crowds. Following the emptying of the building, twenty-three painters were put to work painting the floors. The decorations were left intact, the only changes being in the signs. The accessory crowd in the Coliseum gallery stuck almost to a man, the only withdrawal being the Hayes Mfg. Co., exhibiting bodies. On the second floor of the annex about half the accessory people withdrew because the space was needed for the motor cycles.

Looking back over the week and after talking with some of the leading exhibitors, it is apparent that the results have been particularly gratifying from a business standpoint. The retail sales were particularly heavy, but the buyers were not city folk as a rule. They came in with the dealers from the outlying cities and towns, who lined up their prospects for the show, bringing them in to inspect the new cars and closing with them while they had them here. So far as the city prospects were concerned, they did not do much buying, but there were thousands who left their names at the various booths and who apparently are in the market for cars later on. These people will keep local dealers busy for several months.

Big Rambler Business

Rambler claims to have done the largest business at the show, it being asserted that 187 cars were sold during the week as against 175 a year ago. The Jeffery people concentrated all their efforts on making sales during show week. For a

month previous to the opening they were working to this end, urging their agents to bring in their prospects during the show. There were twenty men in attendance at the booth, ten more at the local branch and still another ten employed conducting excursions to the factory at Kenosha. It is stated that 360 participated in these factory excursions. In a wholesale way, the Rambler probably had 150 dealers in during the week, some coming from as far as Texas. Considerable new territory was apportioned.

Exhibitors Are Satisfied

While the Pierce-Arrow people are not claiming they did more business at this show than they did a year ago, still they are well satisfied because the list of prospects is longer, while the outlook is most gratifying. They say that the show has been a barometer which indicates the best season the industry ever has experienced. It is declared the fact that it is a presidential year will have no effect, this being offset because the big railroad corporations have gone into the market and are placing big orders for stock and supplies.

Hudson claims to have sold thirty-five cars at wholesale and eight at retail and to have placed three new agencies. Besides the crop of prospects is promising. Chalmers reports a run on its 36 and is pleased with the attendance of its dealers. It has been discovered that the show has been the means of closing with people who have been worked upon during the winter and who have waited until the show before placing their orders. The



ANNUAL BANQUET OF CHICAGO AUTOMOBILE TRADE ASSOCIATION AT THE SHERMAN HOUSE

Many Banquets Held During Show Week

Annual Dinner of Chicago Automobile Trade Association Attracts Many Prominent Makers
—Cole, Halladay and Hudson Among Those Concerns Which Entertain
Their Retail Representatives—Indiana Association Meets

business from this source has been particularly pleasing.

Columbia Does Retail Business

Columbia did not attempt to do anything but a retail business at the show. Dealers who came in for territory were taken to the local branch where matters could be talked over without interruption. The retail business was most satisfactory, though, the show being the means of selling at least eight cars, all of which were for the Knight-motored models. The Alco sold something like nine cars during the week, entertained many dealers, had some inquiries from Canada and reports a business twice as good as a year ago. A feature of the week was the sale of a truck to a Chicago business man, who placed the order without seeing the commercial vehicle just because he had an Alco pleasure car. The Premier says it did a big retail business and that probably fourteen cars were sold this way during the week. The Locomobile places its business at seventeen cars, while the Stevens-Duryea is well satisfied because it closed some territory.

S. A. E. RECRUITS

New York, Feb. 5—Advantage of affiliate membership in the Society of Automobile Manufacturers has been taken by the Packard Motor Car Co. of Detroit; Hudson Motor Car Co., of Detroit; Carnegie Steel Co., of Pittsburgh; Standard Welding Co., of Cleveland, and Royal Equipment Co., of Bridgeport, Conn. This is a new membership to which firms or corporations engaged in the manufacture of motor cars or parts are eligible.

CHICAGO, Feb. 2—It is doubted if any banquet ever given by an organization in the motor industry, outside of the Automobile Board of Trade, the old A. L. A. M., the N. A. A. M., and similar national associations, ever attracted so many prominent car manufacturers as did the annual dinner of the Chicago Automobile Trade Association which was held last night at the Sherman house.

Among Those Present

The interest shown in the affair by the big makers really was the feature of the function. At the speakers' table, which was presided over by S. A. Miles, general manager of the N. A. A. M., were Colonel Charles Clifton, president of the Automobile Board of Trade and the Pierce-Arrow Motor Co.; John N. Willys, president of the Willys-Overland Co.; E. P. Chalfant, president of the E. R. Thomas Motor Car Co.; H. O. Smith, president of the Premier Motor Manufacturing Co.; Charles Y. Knight, inventor of the sleeve-valve motor and his partner, L. B. Kilbourne; F. B. Stearns, president of the F. B. Stearns Co.; H. E. Raymond of the B. F. Goodrich Co., and a prominent officer of the Motor and Accessory Manufacturers; N. H. Van Sicklen, Sr., president of the Automobile Trade Association; Henry Paulman, treasurer of the Automobile Trade Association; R. B. Hooper and A. G. Batchelder, respectively, president and secretary of the American Automobile Association; C. R. McMillen and David Beecroft, of the Class Journal Co.; Walter Wardrop, of Power Wagon; W. H. Sexton, corporation counsel representing the city of Chicago,

and Charles E. Gregory, president of the Chicago Motor Club. In addition there were seated at the tables several other prominent tradesmen, including J. I. Handley, president of the American Motors Co.; H. J. Edwards, of the newly formed Edwards Motor Car Co.; B. C. Spitzley, assistant general manager of the Abbott Motor Co., and many others prominent in the accessory business.

Because of the late hour in starting it was impossible to complete the program laid out and so the 100 banqueters had to wind up the evening at 1 o'clock, leaving several speakers unheard from. Those who spoke were Colonel Clifton, whose address was on the present and future of the industry; Mr. Beecroft, on distribution, which dealt largely with traffic conditions as they are applied to commercial vehicles; Corporation Counsel Sexton, on motor vehicles in civic service; Mr. C. Y. Knight, on motoring conditions in Europe; Mr. Raymond on brains, a most witty speech, and Mr. Wardrop, on commercial vehicles.

Charles Y. Knight Talks

Mr. Knight's remarks were based upon European tendencies and he pointed out that in the old world they are taking up the non-poppet valve motor, worm-driven rear axle, wire wheels, silent chain-driven camshaft and electric lighting plants. After discussing these tendencies Mr. Knight wound up by remarking:

"Europe designs; America executes. America sends engineers abroad for ideas and information and Europe sends buyers across here for the finished article after



BANQUET GIVEN HALLADAY DEALERS BY THE STREATOR MOTOR CAR CO.

the American has reduced its production to perfection which he alone appears to be able to reach. After all it is not a bad arrangement."

Corporation Counsel Sexton took advantage of Mr. Beecroft's report on the commercial vehicle situation in Chicago, which was based on actual facts, to promise that if the motorists would appoint a committee to wait upon him he would put that committee in touch with the proper authorities and endeavor to bring about needed reforms in the business districts which would improve motor vehicle conditions.

What impressed Mr. Sexton most was the prediction made by Mr. Beecroft that much time could be saved if the police controlled the pedestrians as well as the vehicles, and he said he saw no reason why the city could not bring about such a reform. Mr. Sexton told how the city had abandoned its municipal motor car service because of the expense, which service had cost the city from \$50,000 to \$70,000 a year. Now Chicago rents its cars when it needs them, paying at the rate of \$2.25 per hour, which has reduced its annual expenses for motor service to \$10,000. As an example of the graft which existed under the old conditions, Mr. Sexton told of a city official who had taken the city car to Europe for which Chicago had to pay.

COLE GIVES A SMOKER

Chicago, Feb. 3—Dealers and owners of Cole cars were tendered a smoker at the Lexington hotel last night by the Henderson Motor Sales Co., the selling organization for the Cole product. Among the 200 guests there was one dealer from Saskatchewan and another from Australia. After a vaudeville entertainment in which the diners provided their own amusement by doing the most of the singing themselves, Toastmaster W. B. Herrick, of the Chicago agency, introduced a number of speakers who told what their departments had done and were planning for Cole owners. Among the speakers were C. P. Henderson, of the sales force; James A. Cole, head of the manufacturing end; A. F. Knoblock, president of the Northway Motor and Mfg. Co.; Gordon, of the Tim-

ken forces; William Esterlick, of Firestone; E. W. Lewis, secretary and treasurer of Timken-Detroit Axle Co.

HALLADAY AGENTS DINED

Chicago, Feb. 1—J. C. Barlow and Paul Chubbuck, who have succeeded in relieving the Streator Motor Car Co. of its financial difficulties, celebrated the clean bill of health given them by Judge Landis by entertaining the Halladay agents at a midnight dinner last night at St. Hubert's grill. Sixty-eight attended the feed and listened to the plans for a big season outlined by the company officials. There was great enthusiasm shown over the outlook and both Mr. Barlow and Mr. Chubbuck assured their representatives that now there no longer existed any legal angles that would have any effect on the company.

HOOSIERS DINE AT AUDITORIUM

Chicago, Feb. 1—Members of the Indiana Automobile Manufacturers' Association held an informal dinner at the Auditorium hotel last night at which action was taken on the application of the accessories manufacturers of the state for admittance to the I. A. M. A. By a unanimous vote it was decided to accept memberships of accessory makers, and at the same time a membership committee was appointed to scrutinize the applications. Expressions of opinion from the representatives of twenty-six Indiana car manufacturers were all favorable to holding the four-states tour this year and a committee on tours was appointed to make preliminary arrangements.

At the meeting Secretary Galbraith of the Hoosier Motor Club offered on behalf of the club its Indianapolis quarters for the use of the I. A. M. A. and the offer was accepted for the next annual meeting of the association February 13. President Frank E. Smith acted as chairman at the dinner and suggested that daily runs of future tours be made shorter, either by shortening total distance or taking more time.

J. I. Handley made the hit of the evening when, in speaking of the importance of the accessory makers in the motor car industry, he stated that the motor cars

had become so popular that many makers of self-starters were adopting motor cars as standard equipment. Among the other speakers were George M. Dickson of the National, Elwood Haynes of the Haynes, H. H. Rice of the Marmon, Will H. Brown of the Mais, C. P. Henderson of the Cole, Philip B. Day of the Great Western, and John G. Monihan of the Premier.

ILLINOIS RETAILERS ORGANIZE

Chicago, Feb. 1—The Automobile Dealers' Association of Illinois was organized Wednesday when thirty-six retail dealers met at the offices of the Motor Car Supply Co., 1451 Michigan avenue, and elected H. E. Shellebarger of Decatur, temporary chairman, and J. H. Munay of Bloomington, secretary. An executive committee consisting of J. C. Thorpe of Champaign, D. Estaque of Jacksonville and J. H. Munay was appointed to draft a constitution and by-laws. The next meeting will be at Bloomington, February 22.

HUDSON COMPANY BREAKFAST

Chicago, Feb. 1—The Hudson company following its usual custom entertained its agents at breakfast this morning at the Chicago Athletic Association, which affair was attended by some fifty dealers who handle the Hudson car. Officers of the company also were present, and during the meal Hudson plans were discussed.

APPEAL IN TIRE CASE

New York, Feb. 5—Formal entry of appeal has been made in the suit of the Republic Rubber Co. against Morgan & Wright involving the alleged infringement of the Mell patent covering anti-skid treads. The order was entered last Friday in the United States court and the matter is likely to come up before the United States circuit court of appeals the latter part of this month. Under the conditions that obtained previous to the order, the status of the manufacturing companies will not be altered pending a further ruling of the court. This status provides for suspending, under bond, the temporary injunction granted against the defendants.

WASHINGTON RECEIVERS NAMED

Washington, D. C., Feb. 6—Wilton J. Lambert and A. Gary Carter have been appointed receivers of the Carter Motor Car Corporation, maker of the Washington car, following the filing of a petition to foreclose under a deed of trust by E. A. Bowers, trustee, and George B. Davenport, holder of promissory notes aggregating \$50,000. It is alleged the securities are in danger, that the corporation is helplessly insolvent, and that under the terms of the deed of trust, foreclosure is deemed urgent. On the showing the court named the receivers fixing their bond at \$20,000.

ALCO ENTERTAINS

Chicago, Feb. 7—The American Locomotive Co. this morning gave a breakfast at the Blackstone to dealers here for the truck show. Fifty were in attendance at the affair.



BREAKFAST OF HUDSON COMPANY AT CHICAGO ATHLETIC ASSOCIATION

Late Happenings in the Motor Industry

Detroit Makes Claim Government Statistics Regarding Exports Err and That Wolverine Concerns Alone Have Shipped Abroad \$20,000,000 Worth of Cars—Lauth-Juergens Expand



COLE COMPANY ENTERTAINS AT LEXINGTON HOTEL DURING CHICAGO SHOW

DETROIT, Mich., Feb. 5—Detroit motor car manufacturers take exception to the report recently issued by the department of commerce and labor, showing that the exports of motor cars from the United States in 1911 amounted to \$20,000,000. They assert that the exports from Detroit alone were in excess of \$20,000,000, and they produce the figures to prove it. Here are the 1911 exports reported by several of the leading manufacturers that have developed a foreign trade:

Ford Motor Co., \$9,000,000; Lozier Motor Car Co., \$250,000; Regal Motor Car Co., \$600,000; Warren Motor Car Co., \$195,000; Studebaker Corporation, \$6,000,000; Packard Motor Car Co., \$600,000; Cadillac Motor Car Co., \$1,750,000; others, \$750,000. One concern that did not care to have its name used gave its exports for the past year as \$900,000.

These figures total \$20,040,000, and do not take into account a number of firms that have developed an extensive export business within the past few months. In the light of this showing, it is up to the department of commerce and labor, the manufacturers think, to revise its tabulation.

LAUTH-JUERGENS EXPANDING

Fremont, O., Feb. 3—At a meeting of the stockholders of the Lauth-Juergens Motor Car Co., held here this week, it was decided to expend a large amount of money in new equipment and additional buildings. Several thousand dollars were subscribed by present stockholders and their friends who attended the meeting. It is expected that the balance of the capital stock will be sold within the next few days and a new issue of \$150,000 ordered. A number of Gibsonburg citizens were present advocating the proposed branch factory of the company in that city for the manufacture of parts. It is expected that the Gibsonburg plant will be 200 feet by 60 feet, with suitable provision for additions. The Fremont plant will at once begin the erection of a building 80 by 250 feet, for assembling

and body-building, and the main building will be used for a machine shop only. By these additions it is hoped to increase the capacity to ten trucks a week.

SWINEHART ADDS TO LINE

Akron, O., Feb. 5—The Swinehart Tire and Rubber Co., of Akron, Ohio, has secured the exclusive rights to manufacture and sell a new car tire, which is the invention of H. S. Keaton of San Francisco. The tire is called a non-skid tire which differs in construction from the types heretofore offered, in that it is of the depression type instead of the projecting knob or stud.

OHIO FORD MEN AT FACTORY

Detroit, Mich., Feb. 5—Ford dealers from Toledo and other northwestern Ohio points were entertained by the Ford Motor Co. last week. The unique part of the affair was that ever dealer brought his banker along, the company numbering 103 persons. The party was headed by the officers of the Roberts Toledo Auto Co., organized 3 years ago by Stanley Roberts, formerly of Detroit. The visitors spent nearly a whole day in the Ford plant, with an intermission for luncheon at the Log Cabin inn, and were guests of the Ford company at a banquet in the Hotel Cadillac in the evening.

NYBERG GETS SOUTHERN PLANT

Chattanooga, Tenn., Feb. 5—The Nyberg Auto Works, capitalized at \$100,000 by Henry Nyberg, Z. T. Patten, C. E. James, J. P. Winn and G. H. Miller, has decided to locate a plant here for the manufacture of the Nyberg car. The trade through the south will be handled from here and the plant at Anderson, Ind., will be continued as the main factory.

DETROITERS INCREASE CAPITAL

Detroit, Mich., Feb. 5—To increase their facilities in response to the demands several Detroit motor car manufacturing concerns have found it necessary to enlarge their capital. The Krit Motor Car Co. has raised its capitalization to \$500,000 from \$250,000 and the Commerce Motor Car Co. from \$25,000 to \$50,000. The Argo

Electric Vehicle Co., of Saginaw, has boosted its capital from \$200,000 to \$400,000. Still another local concern to take on additional capital is the American Auto Trimming Co., which jumps from \$50,000 to \$150,000. Recent incorporations reported by the secretary of state are as follows: Miller Car Co., Detroit, \$50,000; Detroit Battery and Ignition Co., Detroit, \$200,000.

WHEEL CONCERN EMBARRASSED

Pontiac, Mich., Feb. 3—Directors of the Pontiac Wheel Co. have asked that the circuit court appoint a receiver for the company, which is capitalized at \$90,000. The directors say several suits pending against the company have so embarrassed it that it cannot procure money to do business. The company manufactures motor car wheels.

NORWALK RECEIVER SUES BANK

Toledo, O., Feb. 3—A. J. Schurr, trustee in bankruptcy of the Norwalk Motor Car Co., has filed suit in the United States district court at Toledo against the Norwalk National Bank, asking for judgment on a note amounting to \$5,017.46.

MITCHELL TAKING OVER A TIRE

Racine, Wis., Feb. 5—A report coming from England states that a new tire is about to be placed on the market by the Holmes Engineering Co. of London. The ingredients of this new tire are still a profound secret, but it is known that rubber is the base, and that scrap leather ground to a fine powder and mixed with the rubber and other unknown materials under an extremely high pressure are used in its manufacture. The claim is made that it is equally as resilient as the usual type of tire of today, and that in one respect it is even more so for the reason that it can be used with lower air pressure in the inner tube without resultant damage to the casing. It is rumored that the manufacturers of the Mitchell car have secured the exclusive American rights, and that a factory for its manufacture will be erected at Racine in the near future.

**Swinehart Se-
cures Exclusive
Rights To Make
Tires Invented
by H. S. Keaton
— Ohio Ford
Men Visit Fac-
tory — Nyberg
Secures a South-
ern Plant—Pon-
tiac Wheel Co.
Has Trouble**

National Tour from the North to South

American Automobile Association, at Meeting Held in Chicago, Tentatively Selects New Orleans as Finish of Annual Run—Five Cities After Start—Glidden Trophy Gives Way to New Cup Which Will Cost \$5,000

CHICAGO, Feb. 5—New Orleans is the tentative finishing point of this year's annual tour of the American Automobile Association, according to the decision of the executive committee of the A. A. A. which met here during the show, the first session being held Friday, which was followed that same night by a meeting of committees representing the A. A. A. and the Manufacturers' Contest Association, which ratified the old pact between the two organizations. The only change in that agreement is that the agreement may be terminated with 1 month's notice instead of 3. William Schimpf will continue as chairman of the contest board.

Considerable enthusiasm was worked up over the annual tour and while the exact route has not been definitely outlined, certain it is that the annual contest will follow a trail starting from some northern point and ending in the south. The Glidden no longer will be the main trophy, but just what will be done with it has not been decided. Probably it will be used as a minor trophy, something on the order of the Anderson cup. The main trophy will be a \$5,000 bit of plate which will be put up through subscription on the part of the various state associations and which will be known as the National trophy. Already \$1,400 has been contributed by the associations represented at the meeting. David Beecroft is chairman of a sub-committee appointed to raise this money.

The approval of New Orleans as the finishing point of the tour depends upon what that city will do in the way of helping finance the contest. It has been determined that the tour shall be mainly for amateurs, and because of that, that the entry fee shall not be more than \$25 per car. Of course the money raised this way would not be sufficient to pay expenses, so it will be up to the cities selected for the start and finish to help along, while big points along the way will be expected to chip in. Atlanta and Jacksonville last year contributed \$6,000 to the tour fund and it is thought that at least this much should be forthcoming.

There are at least five cities being considered for the start—Detroit, Buffalo, Indianapolis, Cleveland and Cincinnati. Detroit, it is said, already has started a movement to raise a purse to get the plum, while the Hoosiers also are awake to the possibilities. Starting from a northern point this way, the trail undoubtedly will take in Chattanooga and Atlanta as it pierces the south. It also is planned to have a side tour across the Isthmus of Panama after the contest is over.

Reports from Boston state C. J. Glidden has declared his willingness to abide by the decision of the A. A. A. relative to his trophy and that he will be one of the first to enter the national tour. He plans to drive himself.

NEW ORLEANS AS MOTOR CENTER

New Orleans, La., Feb. 5—In view of the fact that the 1912 national tour is likely to finish here, the following facts relative to New Orleans should be interesting:

While New Orleans is the twelfth city in the United States and is the largest city south of the Ohio and Potomac rivers, it does not compare with other cities of the country in the number of motor cars owned. The reason, however, for the fact that there are fewer than 3,000 cars owned in this city is not hard to find. The fluvial highways supplied by the Mississippi river and its many small tributaries, as well as the bayous and inlets from the Gulf of Mexico, have been responsible for a minimum amount of road building.

The good roads that have been built, for the most part, lead to some landing on the water. In many cases, these roads are kept in the best of condition and furnish splendid surfaces for the traffic of several plantations. They generally are of no great length and are not connected one with the other. While state statistics show more than 3,000 miles of improved roads in the state, the fact that that figure is made up of hundreds of separate roads running back into the country a few miles from the river or bayou ports, it can be seen that traveling by motor car in rural Louisiana, especially in the vicinity of New Orleans must be done for the most part on unimproved roads. With a copious rainfall throughout the year, motoring through the country is impossible.

As the 30 miles of water front which bound the city on three sides give rise to very heavy traffic through nearly every section of the city, at least half of the 300 miles of paved streets in this city are surfaced with cobble stones. Even where asphalt is used, the streets often are in poor repair, due to the traffic and the fact that there is no city ordinance against corks on horses' shoes. The territory that can be covered pleasantly or profitably being limited, the popularity of cars has not become as general here as in many other cities.

Within recent months, however, a more decided movement for better streets and country roadways has been launched. The question of good roads was brought up at

the last session of the state legislature and there is reason to think that legislation providing for much new road construction will be passed during the coming session. The municipal government of New Orleans has voted \$7,000,000 for extended drainage in outlying districts of the city, as the first move in an active campaign for improved streets. Under present plans, no less than 200 miles of asphalt pavement will be laid in the residential sections of the city. Dealers are relying on great increased business as a consequence.

Street conditions in New Orleans have been responsible for the unusually large percentage of high grade cars owned here. The cheaper grades of cars have not been able to withstand the strain of cobble stones and pulls through side streets of sticky mud. For this same reason the operation of motor trucks has not given the satisfaction here as elsewhere.

In order to encourage rural road building, the state offers the service of convict labor squads gratis. Convict camps have been established in several parishes and have been of decided assistance to the good roads movement.

CONTEST DATES ASSIGNED

New York, Feb. 6—The contest board of the A. A. A. has sanctioned the annual road race at Bakersfield, Cal., which will be held February 22. Track races at New Orleans in connection with the Mardi Gras celebration, February 17-18, also have received the official O. K. The only other new date for which final sanction has been granted is for the Galveston beach meet August 8, 9 and 10.

Three dates for the Chicago Motor Club have been definitely settled and sanction for each has been issued. These are May 15-17, commercial vehicle test; June 20, Algonquin hill-climb, and October 7-11, reliability run.

Nothing definite as to the Fairmount Park race has developed recently. The exact date and character of the Elgin races for 1912 have not been fixed. If the race is again to be the premier stock car event of the year as it has been in the past, the Chicago Motor Club may take charge, according to announcement from the contest board, which at present is negotiating with the Chicago organization.

A movement is on foot to run the Vanderbilt cup race from Port Jefferson, L. I., and a proposal to that effect has been made to the contest board, but no definite action has been taken so far.

Exhibitions on Minor Show Circuit

St. Louis Cuts to 1 Week and Opens Attractive Display—Pittsburgh Switches to Commercial Vehicles—Canadians Open Up at London—Harrisburg and Bangor in Line—Washington and Worcester Abandon Idea

ST. LOUIS, Mo., Feb. 5—St. Louis is the inaugurator of something new in the line of shows, both fall and winter exhibitions being on the 1912 schedule. The annual independent winter show opened its doors for its second exhibition Monday night. The second annual fall show of the St. Louis Automobile Manufacturers' and Dealers' Association will be held here during fall festival week in October—at one of the summer gardens.

The show which opened its doors Monday night is only a 1-week event. An effort was made to follow the lead of Chicago, New York, Philadelphia and Boston by holding a 2 weeks' show, but sufficient space could not be sold as the association members are at outs with the show organization and members taking part would be suspended, as the result of a new amendment to the association constitution. Because of this only a 1-week exhibition could be put on.

Because of the cold winter in St. Louis, dealers at the show think things will open up slowly and as a result do not look for very much retail business during show week. They do think they will get lots of prospects for spring buying however. They also expect to close agencies, as many out-of-town dealers in St. Louis territory have stated that they will be at the show to close contracts for cars.

As a retail sales proposition dealers here seem to think the fall show is superior. Usually October in St. Louis is not yet very cold and people are still buying machines for use in pleasure riding over the fine St. Louis county roads. Then, most of the new models are just out, too, and it is always a matter of pride if a man can get the new model before his neighbor.

However, the fall show, say dealers, does not bring in the agency business as well as the winter exhibition. The dealer watches his money carefully and doesn't care to tie up a lot of it before winter when he feels he cannot sell any cars.

PITTSBURGH CHANGES SCENERY

Pittsburgh, Pa., Feb. 5—The second week of the Duquesne garden show put on by the Pittsburgh Automobile Dealers' Association will be devoted principally to the exhibits of motor trucks. The attendance during the first week—the pleasure vehicle show—was quite satisfactory, considering the extremely cold weather. Dealers, in addition to making many sales at the show, report a very much better buying spirit, especially from the suburban districts and the country towns, than last year. They also announce that medium-

priced cars will have a big call in the market this year.

The growth of the commercial vehicle business in Pittsburgh is shown by the increasing interest among mercantile firms who visit the Duquesne garden show year after year. Three years ago the first motor truck was exhibited. This week there is a fine collection of vehicles varying in size from a light delivery wagon to a mammoth brewery truck, and including police and fire trucks. The electric delivery wagons are commanding especial attention, as they are driven by single motors and equipped with heavy or light-duty batteries to give them mileage capacity of from 40 miles to 75 miles on a single charge. The show will close Saturday night.

FIRST CANADIAN SHOW

London, Ont., Feb. 7—About 100 various makes of motor cars are on exhibition at the first annual show which opened here this evening at 8 o'clock under the auspices of the London Automobile Dealers' Association. The armories were beautifully decorated with Canadian banners and ornamental columns of uniform design to which are attached shields bearing the names of the various makes of cars on exhibition are neatly arranged about the halls. The following makes of cars are on exhibition at the London show: Colby, Hudson, Overland, Ford, Reo, Franklin, Hupmobile, R. C. H., Nyberg, Maxwell, Chalmers, Stoddard-Dayton, White, Galt, Everitt, Paige-Detroit, E-M-F, Flanders, Oakland, Oldsmobile, Cadillac, White trucks, McIntyre trucks, Ford delivery, Clinton trucks, Brantford trucks, Petrolia trucks, Canadian commercial cars, Hupp-Yeats electrics.

WORCESTER SCRATCHES

Worcester, Mass., Feb. 5—Due to the lack of quarters large enough to exhibit at least fifty different makes of cars, in this city, Worcester will be denied a show this season and the chances are that the day of the show in the heart of the commonwealth of Massachusetts is past, at least until the time when a building is erected with floor space enough to satisfy the demand of the members of the Worcester Licensed Automobile Dealers Association.

WASHINGTON GIVES UP SHOW

Washington, D. C., Feb. 2—At a meeting of the show committee held yesterday it was decided not to hold a motor car show in Washington this year, but Chairman W. C. Long was authorized to lease Convention hall for the first week

in February, 1913, for a show. Inability of the show committee to secure Convention hall during February and the fact that the majority of the dealers were against holding a show as late in the season as March, were responsible for calling off the proposed show. There is some talk of having an opening week later in the season.

BANGOR HOLDING A SHOW

Bangor, Me., Feb. 5—The annual motor car show held by the Bangor dealers opened here this morning and there was a big attendance throughout the day and evening. The show will run a full week and it is being held in the Bangor Motor Co.'s garage on Main street. There are thirty makes of cars being shown. The downtown streets have been strung with electric lights and they make a brilliant display at night.

SHOW AT HARRISBURG

Harrisburg, Pa., Feb. 7—Passenger cars and commercial vehicles vie with each other at the third annual show of the Harrisburg Automobile Dealers' Association which opened at the Arena on Saturday night.

Harrisburg is a center of a rich and largely settled territory of central Pennsylvania and the spread of the motor car to the outlying districts is visible during the early days of show week by the hundreds of out-of-town visitors who have flocked into the large hall. In most cases the visitors from the rural towns have come in crowds of from four to twenty and the result has been that from the very first night of the show the exhibitors have booked orders and in most cases taken down the full cash price of the cars from the rural enthusiasts. Sixty cars of various types are shown in the passenger car class and there are ten commercial vehicles represented.

One of the noticeable features is the sale of cars to farmers and residents of the little towns. The demand from these sources bends toward the standard car of medium price and in many cases the ruralites ask for a car that is convertible for both a business wagon and pleasure car. Central Pennsylvania buyers seem to have made a decision for the standard car regardless of price than for the low priced machines.

One of the features is a new motor tractor built by the Morton Truck Co., of Harrisburg. This huge tractor has been constructed to enter the field of road work and the local concern will enter the road-building campaign.

Virginians Hold Their State Meeting

Despite Opposition and Threats to Withdraw by Other Clubs, Preston Belvin Is Re-elected President—Farmers Backing Up Motorists in Fight for Good Roads in the Old Dominion

RICHMOND, Va., Feb. 2—At the annual meeting of the Virginia State Automobile Association held Wednesday afternoon, President Preston Belvin was unanimously re-elected, in spite of a notice served by the Roanoke Automobile Association stating that that club would withdraw from the state association if Mr. Belvin was again chosen president. The opposition by the Roanoke organization to President Belvin was based on his activity in securing the approval of the Quebec-Miami Highway Association in the link in Virginia via Washington, Fredericksburg, Ashland and Richmond, instead of through the valley of Virginia, thus cutting Roanoke from the main line of the proposed great highway.

Only the Richmond delegates to the state meeting were present, other clubs having had a week's notice and failed to have representatives present.

Vice-presidents were chosen as follows: H. L. Elliott, of Roanoke; W. A. Post, of Newport News; G. S. Embrey, of Fredericksburg; O. B. Barker, of Lynchburg; W. M. Lile, of Charlottesville; J. T. Palmatory, of Richmond. Otis M. Alfriend was re-elected secretary and treasurer.

It is understood that the farmers of the state will back the motorists in an endeavor to have the state legislature, now in session, to pass a wide tire bill which will soon be presented. The bill will provide for wide tires, on all wagons using public roads, and 2 years are allowed the farmers to get rid of their old-fashioned narrow tires. The bill will carry a penalty of from \$10 to \$50 fine for each offense in violation of the law. Manufacturers will be prohibited from selling wagons of narrower tires than provided for in the bill, and all repairs and renewals must be in conformity with the requirements of the law.

The association went on record as opposed to the bill now before the state legislature providing for a further tax on motor cars, the same being classed as class legislation.

The association also went on record to assist the Richmond chamber of commerce in raising funds for the building of the Richmond-Washington portion of the great north and south highway, and also commended the work being done by the chamber of commerce committee on streets, roads and parks.

The Virginia State Automobile Association is deeply interested in two great highways, one running north and south, and the other east and west through the

Old Dominion, and 1912 will see a wonderful amount of constructive work done.

The present state legislature is considering working convicts of the state penitentiary—heretofore leased to manufacturers—upon the highways of the state, and in several counties this work is in progress on a small scale. The measure providing for working convicts as a whole upon the roads will soon be ready for a vote, and it is conceded that the measure stands a first-class chance of becoming a law. The measure, which also includes lime-grinding plants, calls for an appropriation of \$550,000, a portion of which is to apply on the changes necessary to be made in the mode of caring for the convicts. Approximately \$400,000 will be expended upon the highways of the commonwealth.

CAN SPEND MONEY IN ROADS

Pittsburgh, Pa., Feb. 5—In an opinion by John Bell, attorney general of Pennsylvania, money paid to the state for registration of motor cars and the licensing of chauffeurs may be used for improvement of roads without specific appropriation. The question has been much discussed throughout the state, it being held that a reappropriation of thousands of dollars paid into the state treasury was necessary, although the act of April 27, 1910, provided that money so derived should be "used for the improvement of the roads of the commonwealth."

Attorney General Bell holds that the act specifically sets aside the money for road improvement, and that the state auditor shall draw warrants for the highway department covering sums paid into the treasury from motor car registration and licenses so that the commissioner can use the sum for road improvement without special appropriation or red tape.

CANADIAN ROAD SCHEME

Quebec, Feb. 5—At the sitting of the house recently Mr. Taschereau, minister of public works, outlined the system of public highways, upon which the government proposes to guarantee a loan of \$10,000,000, which sum will be available for the towns and municipalities of the province on the payment of half the interest rate of 2 per cent. The minister declared that the project included the macadamizing of four highways between Montreal and Quebec, two on the north and two on the south shore, of a highway from Quebec to the United States boundary, by way of Sherbrooke and Beauce county, of a highway from Quebec to Gaspe, and of a highway from Quebec

to Tadousac. Continuing, Mr. Taschereau added they contemplated a macadamized roadway from Montreal to Sherbrooke, one to Ottawa from Montreal, and another roadway from Montreal to the American frontier. In addition to that there would be funds for the building of 200 miles of road in the Lake St. John district and it was estimated that even then there would be funds for 1,200 miles of macadamized roadway mostly in the vicinity of Montreal.

MICHIGAN ROAD WORK

Lansing, Mich., Feb. 5—Good roads by state reward were benefited to the extent of \$331,438 in 1911, according to a statement recently issued by O. B. Fuller, auditor-general. The growth of the good road idea in Michigan is shown by the fact that the state road tax has grown from \$5,000 in 1903 to \$245,000 in 1911. The rewards paid by the state to the counties for better highways have grown from \$13,674 in 1906 to nearly twenty-five times that amount in the past year. A total of \$719,310 has been paid to the counties in 6 years. Thirty-three counties shows an excess of road rewards over the amount of road tax apportioned to them. Fifty show an excess of highway tax over rewards. Counties get into the reward column by voting at special elections to take advantage of the state highway fund and comply with its provision. Twenty counties did not receive rewards. But thirteen will have special elections this spring to vote on whether to adopt the county road system.

QUAKERS HOLD A BANQUET

Philadelphia, Pa., Feb. 1—Upward of 200 members and guests attended the national and state highways assembly and fourth annual banquet of the Quaker City Motor Club held at the Hotel Walton on Tuesday evening, and the function was unanimously voted the most interesting and successful ever held by the organization. The keynote of the speakers was a campaign for a succession of good roads all over the state, and men eminently qualified by environment and experience gave hearty endorsement to an elaborate system of highways built to withstand any kind of traffic and built to last. Reminiscences of the organization and early history of the Quaker City Motor Club, its accomplishments and the Fairmont park race were also dwelt upon by nearly all the speakers. Among the speakers were President Paul B. Huyette, of the Q. M. C.; Director of Public Safety Porter, Former Mayor Reyburn, J. B. Weeks, president of the Delaware County Automobile Club, and Powell Evans, president of the Automobile Club of Philadelphia.

BOSTON MEETINGS

Boston, Mass., Feb. 5—The National Automobile Association has started on another year of existence with brighter prospects than ever. At its annual meeting

the following officers were elected: Samuel E. Winslow, of Worcester, president; A. G. Bullock, Worcester, first vice-president; Elmer J. Bliss, second vice-president; Allan Forbes, treasurer; Francis Huturbis, Jr., secretary and general counsel.

The Massachusetts Automobile Operators' Association at its annual meeting in Boston recently elected the following officers: J. Edward Connors, president; Fred Pratt, first vice-president; Fred Spain, second vice-president; W. B. Ferguson, third vice-president; David Michael, recording secretary; G. J. McDonald, financial secretary and treasurer.

The Highway Safety League is the latest organization to be formed in Boston, and it was launched this week, following 2 months of agitation on the part of the promoters, several of whom are prominent in public life in Boston. The league came into being as the result of several motor accidents in which people were injured and killed the past few months in the Bay State, and its promoters expect to do some good in reducing the dangers incident to the use of motor cars. Morefield Story, who started the agitation, was chosen president.

SAVANNAH ROAD RACING PROFITS

Savannah, Ga., Feb. 3.—Profits on the road races here at Thanksgiving time are announced to amount to \$3,683.94, the receipts totaling \$54,120.74. The profits will be still further cut down when the soldiers are paid, which will leave the Savannah Automobile Club something like \$2,000. The receipts were made up as follows: Grand prix entries, \$10,750; Vanderbilt entries, \$5,500; Savannah challenge cup entries, \$1,300; Tiedeman trophy entries, \$1,150; ticket sale, \$29,005; paddock sale, \$377; concessions, \$3,203; railroad coupons, \$2,835.50.

Expenses were heavier than in the preceding meet. It cost \$9,623.62 to oil the 1911 course as against \$3,500 in 1910; the prize list amounted to \$12,500, \$2,500 increase, while the Savannah Automobile Club had to pay the Motor Cups Holding Co. \$2,500 to get the two trophies.

BANQUET AT SPRINGFIELD

Springfield, Mass., Feb. 7.—Special telegram—The annual banquet of the Automobile Club of Springfield was held to night in the Worthy hotel, and some 200 members and their friends gathered to listen to the addresses of R. B. Hooper, president of the American Automobile Association, Louis R. Speare, president of the Massachusetts Automobile Association and Mayor Lathrop C. C. Spellman, of Springfield. Besides the three mentioned men, George C. Diehl, of New York, chairman of the A. A. A. good roads committee and Charles T. Terry, of New York, chairman of the A. A. A. legislative committee also were present at the banquet as guests of the club.

District Will Collect the Wheel Tax

Constitutionality of Measure Having Been Upheld at Washington, Authorities Now Will Enforce It—Interesting Decision Rendered at Philadelphia Having to Do with Injured Chauffeur

WASHINGTON, D. C., Feb. 5.—The court of appeals having upheld the constitutionality of the wheel tax law, plans for the strict enforcement of the statute are being made by W. P. Richards, the district assessor. Notices that the tax is due will be sent to every owner of a motor car in the District of Columbia and failure to pay will result in a summons to the police court. The penalty for nonpayment of the tax, under the law relating to the collection of licenses, approved July 1, 1902, is a fine of not more than \$500 or 30 days imprisonment.

This tax was authorized in the district appropriation bill of March 3, 1909, which provided "that hereafter there shall be assessed and collected an annual wheel tax on all motor cars owned and operated in the District of Columbia having seats for two persons the sum of \$3, and on all such vehicles having seats for more than two persons an additional tax of \$2 for each additional seat." No penalty was provided for nonpayment, and on account of the difficulty in enforcing the law, an amendment to the act was included in the district appropriation bill of March 18, 1910, providing for fine or imprisonment. The constitutionality of the law was tested in the police court by Leroy Mark, manager of the southeastern division of the Touring Club of America, resulting in a verdict in favor of the district, which was approved by the court of appeals.

The following policy has been adopted by Assessor Richards for the collection of the tax: The rate of assessment will be based upon the number of seats, a seat accommodating two persons to be \$3, and each additional seat, whether it holds one, two or three persons, to be \$2 each. Owners and operators coming to the city for temporary stay will not be taxed. Those residing in adjoining states, who come to Washington daily on business, are liable to the tax.

RULES ON ELEVATOR ACCIDENT

Philadelphia, Pa., Feb. 5.—The largest award ever made in the Philadelphia courts in a suit to recover damages for personal injuries was recorded last week, a jury in common pleas court No. 5 giving Frank Force \$34,000 in his suit against the Quaker City Automobile Co., Broad and Race streets, for injury received as the result of an elevator accident in the company's building.

Force, up until the day of the accident, May 20, 1907, had been employed by A. F. Huston, president of the Lukens Iron & Steel Co., of Coatesville, as a machinist

and chauffeur. On the day in question, Force took one of his employer's cars to the defendant company's shop for repairs.

He was instructed to take the car to the sixth floor in the freight elevator. Approaching the sixth floor the fastenings of the cables parted, and the elevator and its burden plunged to the bottom of the shaft. Force was injured—his back was broken, the spinal cord severed and he is now a helpless paralytic.

Alexander Simpson, Jr., counsel for the company, contended that negligence could not legally be charged against it, arguing that as the elevator had been installed by a competent firm, the presumption was that the elevator was in a safe condition. On the other hand, T. Walter Gilkyson and J. Whitaker Thompson, counsel for the injured man, asserted that a company operating an elevator bore the same relation to the general public as a common carrier and therefore was legally required to maintain the elevator in a safe condition and exercise care to prevent accidents, a contention that was upheld by the court.

Counsel for the company have filed motion in the same court to have the verdict set aside and judgment entered for the company, and also for a new trial.

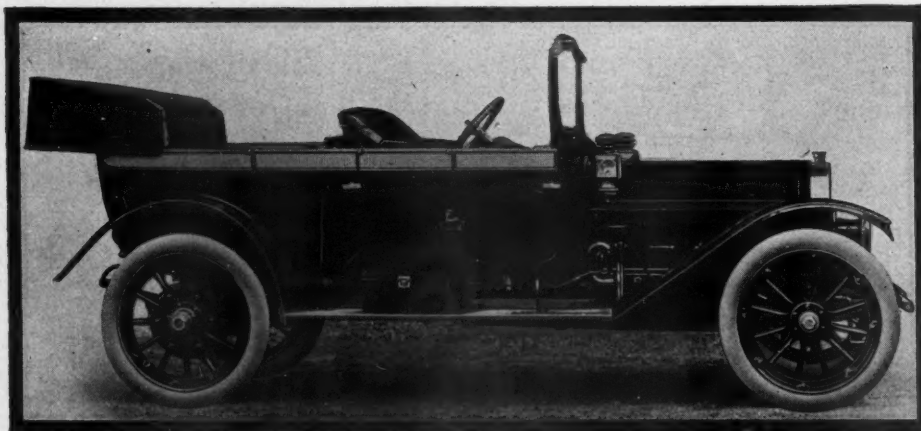
PITTSBURGH WANTS TO MOTORIZE

Pittsburgh, Pa., Feb. 5.—Following the suggestion and recommendations of Mayor Magee and Director of Public Safety John Morin, the Pittsburgh council is preparing an ordinance providing for the gradual supplanting of horse-drawn fire-fighting apparatus with motor equipment.

The occasion for the change was made apparent this week, when the council was making its appropriations for the annual budget. It developed that Pittsburgh is paying nearly \$200,000 per year for the upkeep of horses and that the horse-shoeing bill alone approximated \$24,000 per year.

However, the purchase of motor fire-fighting apparatus has been authorized and a bill was passed providing for the purchase of six new combination motor-propelled hose wagons at a cost not to exceed \$5,500 each. It was the expressed intent of the council to add to the motor-propelled fire equipment in the future and to gradually eliminate the horse-drawn vehicles. The hilly topography of the city is another influence that is working against the use of horse-propelled apparatus, it being necessary to provide three and four-horse equipment in nearly all the outlying sections of the city.

Three Styles Secured from One Body



STEVENS-DURYEA CONVERTIBLE PHAETON AS OPEN TOURING CAR

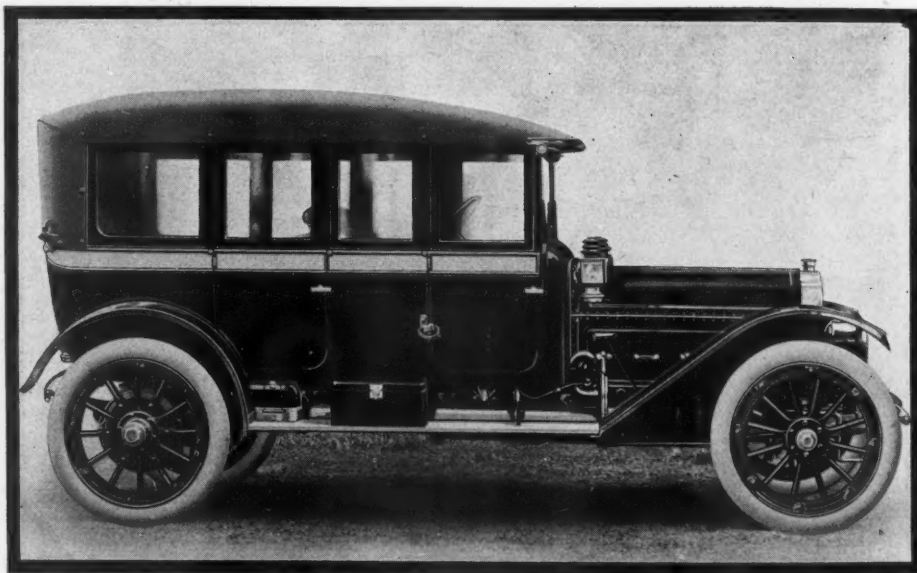
AS the latest addition to the line of bodies that are fitted to Stevens-Duryea six-cylinder model AA chassis there has been brought out a convertible phaeton which on short notice can be changed from a fully-inclosed body to a semi-inclosed body or to an open touring car. As an open car with the top folded down there is no abnormal appearance or unsightly projection to call attention to the fact that the body can be entirely inclosed with glass windows. When the top is raised access is not interfered with by bows running diagonally over the doorways.

The design is shown in three illustrations and it will be noted that a folding top is employed which is carried on heavy perpendicular bows and that the glass windows in the doors may be dropped into them to form the semi-open car when the top is up or the ordinary touring car when the top is down. In this connection it will be noticed that it is unnecessary to unbutton side curtains and crawl under them to get in or out.

The operation of changing the car from an open touring car to inclosed phaeton consists of putting up the top in the ordinary way, opening the doors, unbuttoning the pads and raising the hinged glass to an upright position, where it is firmly held by springs. The four remaining glass windows are removed from a box on the back of the front seat and slipped into place where each one is secured by tightening two winged nuts with the hands. The whole operating of putting the glass into position is said to take but 3 or 4 minutes. The glass front is fitted with a snow-scraper, the use of which obviates the necessity of driving with the front open. The glass front is suspended from the top and when swung in at the bottom provides thorough ventilation to the front of the body, while the undivided glass gives a clear vision of the road.

It is claimed that this style of top adds but 75 pounds on the average to the

weight. An important item is the absence of noise and rattling which has prejudiced many against any form of collapsible body. The absence of the solid roof eliminates reverberation which is sometimes



NEW CONVERTIBLE BODY OF STEVENS-DURYEA PHAETON AS CLOSED CAR

noticeable in limousine and landaulet bodies.

Schacht Eight-Passenger Car

One of the illustrations shows the new eight-passenger touring body of the Schacht car in which will be noticed the unique seating arrangement. The conventional double front seat is used, but in the unusually roomy tonneau, in addition to the forward facing rear seat, there is a middle seat facing towards the rear so that the tonneau passengers are seated vis-a-vis. Both rear seats are sufficiently wide to comfortably seat three people and the tonneau is large enough to give plenty of foot room without crowding. It will be noticed that the body lines have not been impaired by this arrangement. In fact the gradual swelling of the body

The Stevens-Duryea Touring Car Can Be Converted into a Phaeton or an Inclosed Type

toward the rear gives a gunboat appearance with an extremely speedy effect.

World's Body Styles

"After a trip to Europe to study the styles I hurried back for the shows," says H. Jay Hayes, of the Hayes Mfg. Co., builder of bodies. "Comparing the fashions of the new and old worlds, I believe American bodymakers cannot be beaten for beauty of lines and general symmetry.

"Every owner in Europe wants the body of his car a little bit different from his neighbor's. Of course that results in some outlandish freaks among the English, French, German and Belgium car bodies. Of course, the foreign makers never will be turning out metal bodies on

their cars, because none of them makes enough bodies in a year to pay for the dies necessary in making all-metal bodies. At least, not more than one or two foreign makers could do that.

"I visited one body factory in Belgium where they built 750 bodies in a year. It takes 750 men to do the job, one man for each body. The body cost \$1,600; \$420 of that sum represents the labor put upon the body, while the other represents the cost of materials and overhead expense. Production on such a small scale is what causes the terrific prices for the finest foreign work on bodies.

"It is the same all along the line over there in motor car manufacturing. One man in a factory will build a whole car and it will take him a whole year to do

Schacht Puts Out Eight-Passenger Car

Extra Capacity Secured by Means of Middle Seat Capable of Carrying Three Passengers

it, but that one man will turn out the entire job. In this country where specialization is down to such a fine point, the cost of production is vastly reduced by having one set of workmen do only a certain kind of work. Far more cars can be put through a factory in that manner.

"I believe the foreign manufacturers of motor cars never will be able to compete seriously with American manufacturers, on account of the vast differences in their system of manufacture."

PARIS CHAUFFEURS ON STRIKE

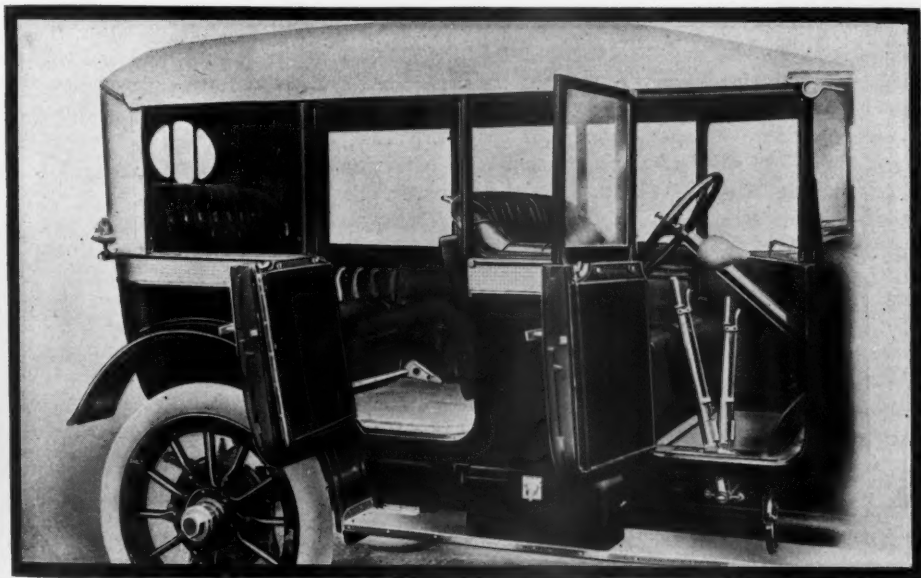
Paris, Jan. 25—Paris taxicab drivers are on strike. They have been on strike for a month, and are likely to remain



SEATING ARRANGEMENT OF NEW SCHACHT EIGHT-PASSENGER CAR

the daily subscriptions they were assured of a living wage, while the big fleets owned by the operating companies were reduced to idleness. There has been no disturbance, for there has been no black-

power. It is the limited license which has been issued to the great majority of the Paris taxicab men, the document stating definitely that they can only drive a Renault, a Unic, or a Delahaye of 8, 10 or 12 horsepower. As there are only three government inspectors in Paris, it was only necessary for the men holding the limited license to make application for the unlimited document, in order to so choke the lists of waiting applicants for examination that there would be no possibility of new men being called up for at least 6 months.



NEW CONVERTIBLE STEVENS-DURYEA PHAETON WITH SIDE PANELS REMOVED

on strike for months more. They have grievances against the city authorities for raising the town duties on benzol, against the police on account of their increased severity, and against the operating companies for refusal to increase their percentages.

Of the 7,500 cabs in Paris about 2,000 belong to the drivers, to co-operative societies, and to small companies in sympathy with the strike movement. These 2,000 were allowed to go on the streets on condition that each driver paid \$1 per day into the strike fund. A badge, changed every morning, indicates that the fee has been paid, and so strict is the surveillance that not a single cab has ventured on the streets without this badge. The men are quite satisfied with the situation, for with the funds in hand and

legs; incidentally there have been fewer accidents, for 5,000 of the most reckless drivers have been rendered harmless.

A few days ago the companies attempted to fool the strikers by sending out the school cabs with the intention of quickly training a staff of men to handle their machines. There were free fights and arrests for a few days, until one of the members of the strike committee conceived a much more scientific method of combating the company. No man can drive a motor car in France until he has passed a government examination and received a license from the police. The licenses are roughly divided into two classes: those allowing the holder to drive a car of a determined make and horsepower, and those giving permission to handle any make of car of any horse-

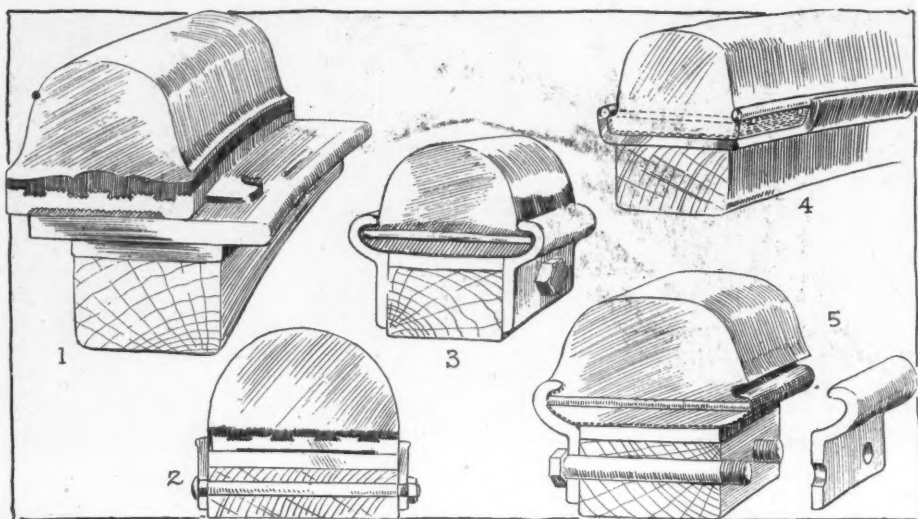
PITTSBURGH STARTS TRUCK PLANT

Pittsburgh, Pa., Feb. 5—Work has just been begun on the first all-Pittsburgh motor car. The Lange Motor Truck Co. in its new fireproof factory in South St. Clair street is turning out its initial order for 100 trucks. Two sizes of trucks will be built—1-ton and 2-ton capacity. The officials of the Lange Motor Truck Co. formerly were in active charge of the affairs of the H. Lange Wagon Co., builders of horse-drawn vehicles, for more than 40 years. The Lange truck truly is a Pittsburgh product. All the material that possibly could be purchased of a Pittsburgh maker is used. The axles and springs are made by the Liggett Spring & Axle Co., and the frame material is furnished by Jones & Laughlin, Ltd., both of Pittsburgh. All the work is finished and assembled by the Lange company, as well as the jack-shaft construction. All the bolts, set screws, rivets, etc., and the cold rolled steel, vanadium products and nickel alloy steel are purchased in Pittsburgh.

TULSA TRUCK PLANT OPERATING

Tulsa, Ok., Feb. 7.—The Dowagiac Motor Car Co. of Dowagiac, Mich., has moved to Tulsa, and is now a part of the Tulsa Auto and Mfg. Co. of Tulsa. The Tulsa company will manufacture ½, 1 and 2-ton trucks, and expects to make its first deliveries about April 1.

Truck Tires a Factor in Operating Cost



TYPES OF SINGLE SOLID TIRES, SHOWING ATTACHMENT METHODS
1, Goodrich Wireless; 2, Polack Wireless; 3, Republic New Semi-Hard Base; 4, Firestone Special Electric; 5, Swinehart Detachable Solid

TO make the employment of commercial vehicles profitable as a means of transportation in the business world, the problem reduces chiefly to a basis of productive miles, in which the units of results and costs become miles, hours and tons. Regardless of the first cost of tires, the user is concerned chiefly, or practically all together with the cost per ton-mile run, and on that basis must the economy of the tires be calculated.

When it becomes necessary to lay up a vehicle in commercial service for repairs, a large proportion of the expense charged against the vehicle is continuous while it is out of service, and excessive dead time when the vehicle is not productive adds materially to the cost per ton-mile expense which is charged against it on the daily cost sheets.

One of the chief items is the loss of time required for tire replacements and repairs, and it is the main endeavor of tire manufacturers to make replacements rapid and to provide arrangements so that the operator of the vehicle may make these replacements without the requirement that the wheel be taken off and sent to the factory or branch for repair.

Replacement Made Easy

This season shows a marked advance in commercial car tires towards ease and rapidity of replacements. Practically all truck tire-makers are producing designs of tires or rims which have the quick detachable feature, particularly in the case of single tires. There are more makers than ever before putting out the dual tires in ready detachable form so that both the inner and outer tire can be removed and replaced without the necessity of demounting the wheel from the vehicle. In practically every instance the demountable feature is obtained by making the outer flange which holds the tire on the

rim removable so that one or both tires can be slid off toward the outside.

There is a marked increase in the number of tire makers who are showing the block tire for this year, particularly for the heaviest class of commercial work. There are two advantages claimed for the block tire. The chief of these, of course, is the unit construction, by which when one block becomes worn or damaged it may be replaced without necessitating the expense of an entire new tire. The other feature is that the sectional arrangement affords space for the rubber to flow into under compression instead of having the whole body of the tire tend to push forward in front of the compressed portion as is the tendency with the continuous tire.

S. A. E. Standard Adopted

The greatest development in the commercial tire situation for the year is in the almost universal adoption of standard sizes recommended by the S. A. E.

In the field of pneumatic tires for commercial service there is noted an increase of special pneumatics. As the demand for commercial cars and fire department apparatus is constantly increasing, there is a corresponding increase in the demand for tire equipments which will permit of the cars being used at high speed without subjecting them to the strains due to the road shocks. Manufacturers of passenger cars have been able to bring them to their present refinement largely through the co-operation of the tire manufacturers, and there are certain classes of commercial work in which weight carrying capacity is not so important as high speed where the conditions are similar to the passenger-car field. A logical step from the passenger car pneumatics is the recent development of the special pneumatics for fast express and delivery serv-

Time Required for the Replacement Reduced by New Methods of Attachment—Individual Block Types in Favor for Heavy Commercial Work

ice, and for fire department use. In order to carry heavy loads on pneumatics without using the tire so large in cross sectional diameter as to be both cumbersome and expensive, tire makers have resorted to the mounting of two smaller tires on the same wheel. The use of this dual or twin tire equipment is proving very successful on cars having a carrying capacity of 2 tons and under. The necessity for ready demounting of pneumatics is greater than that of the solid tires because of their more fragile construction. Nearly every maker of commercial pneumatics is featuring a rim of the quick demountable type for both single and dual.

Tire Guarantees

The matter of the service guarantee of commercial tires is of more importance than that of tires for passenger carrying vehicles because with the business wagon tire cost becomes purely a dollars-and-cents proposition, whereas the man who drives his car for pleasure is influenced almost as much by the inconvenience of tire trouble as by its expense. Tire guarantees in commercial work have not yet reached the standardization that has occurred in the passenger carrying field. So far as the pneumatic tires are concerned the guarantees in general are on a strictly mileage basis and are practically the same as those in the lighter form of tires. From 3,500 to 5,000 miles is the usual guarantee, the greater proportion of them being warranted to give the shorter term of service. The Ajax tires are guaranteed for 5,000 miles and Fisk tires, while nominally guaranteed at 3,500 miles, are subject to adjustment up to 6,000 miles if found defective as to material or manufacture. Several makers of pneumatic tires, the Republic, for instance, limit their guarantee to 12 months from date of purchase.

In the field of solid tires there is a much greater discrepancy in the guaranteed mileage. Several manufacturers, including the United States Tire Co. and Good-year, guarantee their tires for 10,000 miles. Others, including the Republic and Diamond, guarantee them for 8,000 miles; while the Kelly-Springfield tires are warranted for 6,000 miles, good for 6 months. Other tires are guaranteed for different mileage, depending upon the service in which they are used. Two of these are the Swinehart and Polack, the former averaging a 7,500-mile guarantee and the latter an 8,000-mile guarantee. That no definite mileage guarantee for any one

Methods for Quick Replacement Feature

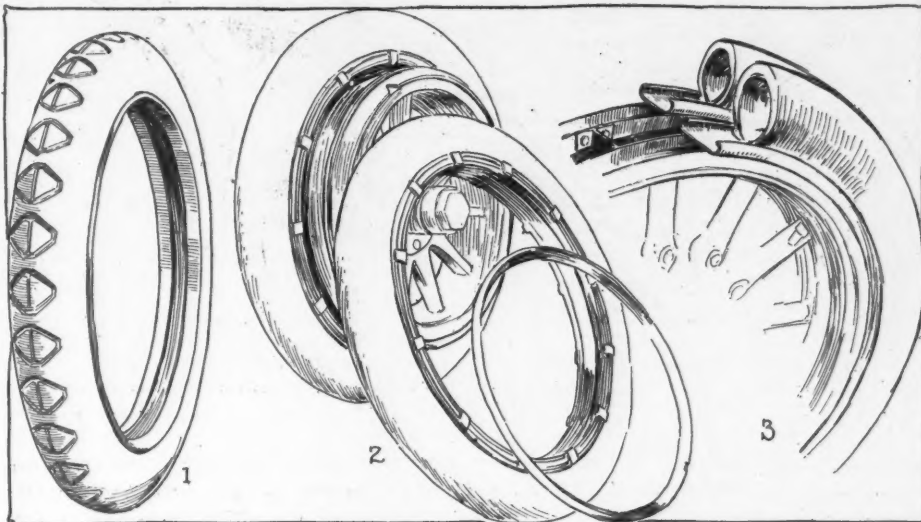
Special Pneumatics in Single and Dual Form Employed for Fire Departments and Rapid Express Service—Tire Guarantees and Adjustments

size of tire can be made fair to both purchaser and maker is recognized by practically all the manufacturers even when, as is always the case, the maximum load capacity is stipulated. The speed at which the cars are run, duration of continuous use, and the mere age of the tire are determining factors in their wearing qualities. The maker of the Firestone tires have gone perhaps further than any other commercial tire manufacturer. The guarantees and adjustments of these tires are based upon a daily service plan in which the daily mileage and the maximum weight, effect not only the mileage guarantee but also the period over which the guarantee is effective.

The diameter of the wheel has been taken into consideration as well as the cross section of the tire in determining the maximum load to be carried on the wheel, a factor which is not always given the consideration it deserves. The other two makers whose guarantees are based in general upon the service conditions are taking these points into consideration in a more general way, but their method would seem to be open to the objection that without a definite rate, such as that above, the different guarantees necessitated by different conditions of service might cause misunderstanding in the minds of the users.

Service Adjustments

In the matter of adjustments, tire makers pursue the same policy throughout the industry. When a tire fails, owing to some fault of material or construction now tires are supplied at a price which is the difference between the list price of the new tires are supplied at a price which is completing the mileage guarantee on the



PNEUMATIC TIRES IN SINGLE AND DUAL FORM

1, New Keaton Non-Skid Tread of Swinehart Passenger and Truck Tire; 2, Fisk Dual Demountable; 3, Michelin Dual Tire and Rim

old tire; that is, if the tire is guaranteed for 4,000 miles and breaks down after 2,000 miles running a new tire is supplied at half price.

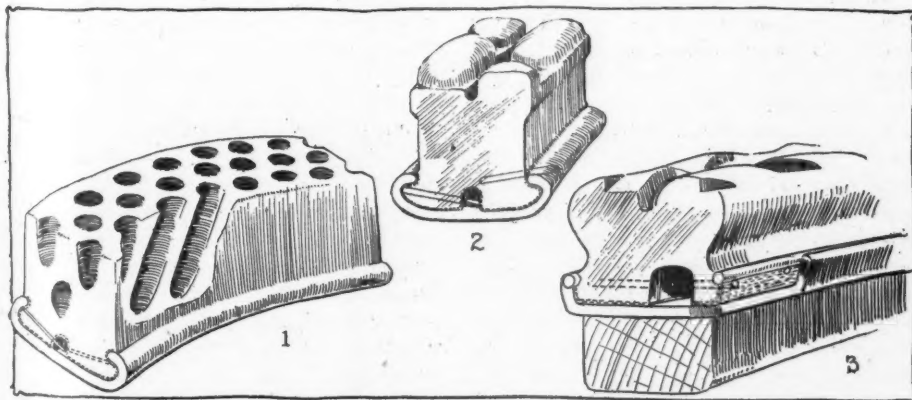
Ajax—No solid tires are made in the Ajax line nor is there any special pneumatic for commercial cars. The regular passenger car pneumatics are supplied in single form for speedy, light commercial cars and in dual form for trucks up to 1½ to 2-tons capacity.

Consolidated—Two new tires have been brought out for commercial service by the Consolidated Rubber Tire Co.; one of these is a new wireless solid tire for light work and the other is a new individual block tire somewhat similar to that of the standard Kelly-Springfield block which has been on the market for some time. The chief feature of difference between the two tires is that the newer one, which is called the Marion, is arranged so that by the removal of three nuts a section of rim which holds two blocks in place may be released, making the replacement of the blocks very easy. In the older style it is necessary to remove a section of the rim

which releases one-quarter of the entire number of blocks on the tire. The new tire is made at present in dual form only.

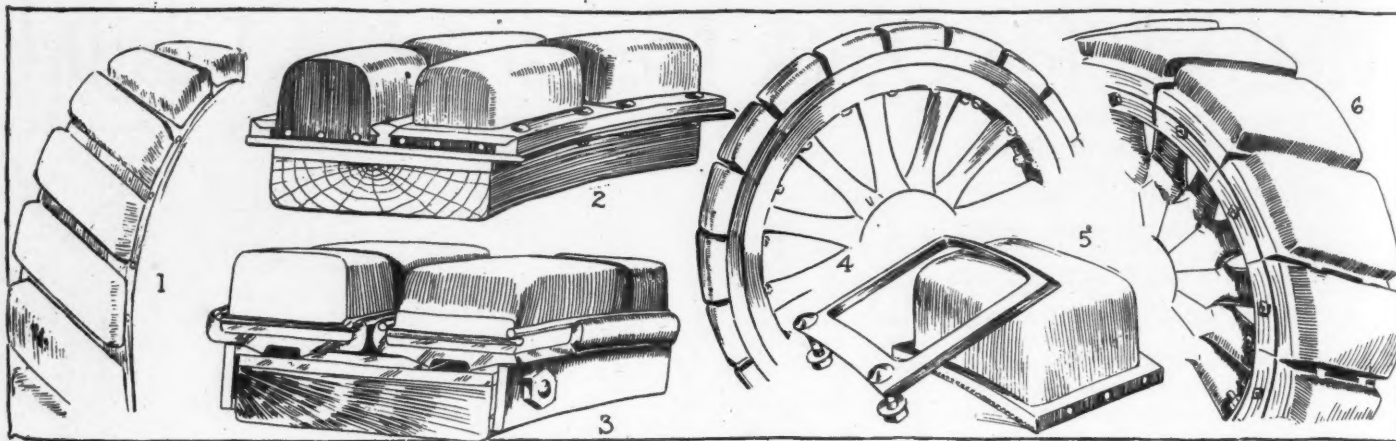
Diagonal Block Tires—The Diagonal Block Tire Co. is producing a block form of tire for heavy duty in which the blocks instead of being transversely across the face of the rim are placed diagonally so that a large proportion of two of the blocks are in contact with the ground at all times. This feature is said to give a more smooth action to the wheel. A special feature is that every block is independently demountable. The removal is accomplished by the use of two U-shaped head bolts running downward through the felloe and a crosswise bolt through the flange. Each diagonal shoe has a downward turned flange with a hook projecting upward. This is to prevent the shoe from slipping sideways as the flange fits over the felloe.

Diamond—Newest in the Diamond line of truck tires is a dual demountable pneumatic designed specially for light commercial service and for fire department use. The most important type of tire of Diamond construction is the solid wire mesh base tire. These are applied in either single or dual form and are what may be called semi-demountable. Removal is effected by straightening out two wire clamps that pass through the rim and are clinched on the under side. On the upper side these hold a series of blocks which retain the tire in place. When the wires are straightened out they may be pulled through the rim, releasing the tire. There is no central ring, so that both treads of a dual tire may be removed from the outside. In the side-wire type of tires there are single, dual and twin arrangements; in the single form these tires are intended only for moderate service requirements. For light delivery service there is



FORMS OF CUSHION TIRES FOR LIGHT DELIVERY WORK

1, Swinehart Cellular Tire, Clincher Type; 2, Republic New Staggard Tread Cushion; 3, New Firestone Cushion



BLOCK TIRES OF VARIOUS TYPES

1, Goodyear New Individual Diagonal Block; 2, Goodyear Dual Removable Block; 3, Firestone Side-Wire Dual Block; 4, Consolidated Marion Block; 5, Goodyear Block With Individual Fastening; 6, Diagonal Block Tire Co.'s Design

a clincher type of solid rubber tire with corrugated tread which is designed to be interchangeable with pneumatic tires. A cushioning effect is obtained by cutting out a circumferential tunnel in the rubber next to the rim.

Empire—There are no solid tires in the Empire line, the regular pneumatic being used for light commercial work in both single and dual forms.

Federal—The Federal rugged-tread pneumatic is employed in commercial service for cars to 1½ tons capacity in both single and dual form. No special truck tires are made by this company.

Firestone—The chief feature of the Firestone line is the production this year of a complete series of six distinct types giving a special design of truck tire for all types of cars, loads and the various conditions of service. In tires on electric trucks and passenger vehicles there is a choice between the special electric tire of standard design and the new cushion electric. The latter is made in the regular side-wire type and the rims are interchangeable with pneumatic tires without alteration of felloe. For heavy trucks there is in addition to the regular line a new tire of the European type with a hard rubber base vulcanized to the main portion. It has no cross bars or side wires. Besides this there is a new side-wire block tire with a continuous base. This is a quick removable style and the blocks are arranged in dual. The Firestone dual pneumatic tires with quick detachable demountable rims are used extensively on fire apparatus and on trucks where high speed and small tonnage make them preferable. The tires are constructed especially for this class of work. The regular cushion electric tire, while not an entirely new invention, has been improved in its riding qualities by giving it a double tread and by adding internal cavities at frequent intervals in the base directly under the tread.

Fisk—The Fisk Rubber Co. is featuring a special dual pneumatic equipment for commercial cars and fire department apparatus. This equipment includes a dual re-

movable rim in which the same features are employed as in the Fisk removable rim for pleasure cars. The process of removing both tires includes taking off 5 outside rim nuts, outside expanding rim, six inside rim nuts and inside expanding rim. The Fisk bolted-on type of tire is used for this equipment. There is also a dual block tire for heavy commercial work. The blocks are interchangeable by removing three sections of rim which are bolted through the felloe. There are no continuous solid tires in the Fisk line.

Gibney—One of the earliest wireless tires was the Gibney, made by James L. Gibney & Brothers. The tire has a metal base which is mechanically attached to a hard rubber sub-base, and upon this hard rubber sub-base is vulcanized the tread. The tire is applied over the steel felloe band and is held in place by means of side plates bolted to the felloe. A key in the felloe band which fits into a groove on the under side of the metal tire base prevents creeping of the tire. Removal is accomplished by removing the nuts which hold the outside plate in place. The tires are marketed in both single and dual types. A side-wire tire of the usual type is included in this line.

Goodrich—There are several new features in the Goodrich line of commercial tires, one of which is the special truck pneumatic tire which is designed particularly for fire department service. It is put out with a demountable rim in both single and dual forms and has a corrugated tread to prevent skidding. There also is a dual and single, solid demountable and a dual individual block tire. The blocks are removed by taking off a sectional holding rim. The solid tires of this make range in size from the 19 by 3½-inch tire used on the electric baggage trucks in railway stations to the heavy 60 by 6-inch tires employed on some of the steamers and the service of the New York fire department. The Goodrich wireless solid tire of the European type has a steel base dovetailed on its upper surface, is united to a hard rubber sub-base and this in turn vulcanized to the soft rubber wiring surface. A

flat key screwed to the rim fits a transverse keyway in the metal of the tire to prevent creeping.

Goodyear—Among the new types of tires in the Goodyear line is an individual block tire in dual form in which the blocks are removable. It is said the replacement of a block can be made in 10 minutes. Each block has a steel base through which it is bolted to the rim. There is also a new continuous single demountable tire for heavy-duty service which appears in both single and dual forms. It is of the European wireless type. It is fastened to the rim by means of a separate wedge ring and side flange and like the other new ones is made according to the specifications of the Society of Automobile Engineers. An older type is a metal base design which is not removable. For delivery service and electric, the Goodyear Tire and Rubber Co. is bringing out a tire of the Motz design which has the features of dual tread with bridge construction of cushion. It is a demountable type with removable side flange. One of the uses for which it is intended is in connection with fire department service. The latest addition to this line is a diagonal block tread with removable blocks. The size featured at present is the 9-inch tread.

Lee—No solid tires are included in the line of the Lee Tire and Rubber Co., but the puncture-proof casing for pneumatic tires which is a feature of this maker's construction is marketed for use on commercial cars up to 1½ tons capacity in single form or twice that capacity in dual.

Michelin—Michelin twin tire equipment is manufactured particularly for light, high-speed commercial and fire department service. A feature of this equipment is its special wheel and dual expanding rims which permit easy and quick tire changes. In equipping wheels with dual pneumatics the Michelin people rebuild the wheel, fitting a special steel felloe with which the demountable rim feature is incorporated.

Motz—Motz cushion tires in either the double or single tread types are marketed for use in light delivery service. For use

on heavy trucks where maximum carrying load and not speed is the factor the Motz solid truck tire is designed. These like the cushion tires are interchangeable in any standard one piece clincher, universal detachable or demountable rim.

Polack—The Polack truck tires are the same in design and manufacture in every detail as the tires of this name made in Germany for the past 9 years. The chief features of this line of tires is in the shape, which is nearly a semicircle in cross section, and also in the construction of the base. The base consists of a steel plate, the upper part of which is dovetailed and corrugated. Molded into this there is a hard rubber sub-base to which is vulcanized the round tread. They are made in twin and single types and are removable by taking off a flange ring secured by bolt through the felloe.

Portage—The Portage motor truck tires are made of one form only, that of a dual block tire in which the two rows of blocks are staggered. The individual blocks are demountable by removing a bar for each block which clamps over its widened base and is bolted through the rim. One of the illustrations shows the shape of the block and the holding bar.

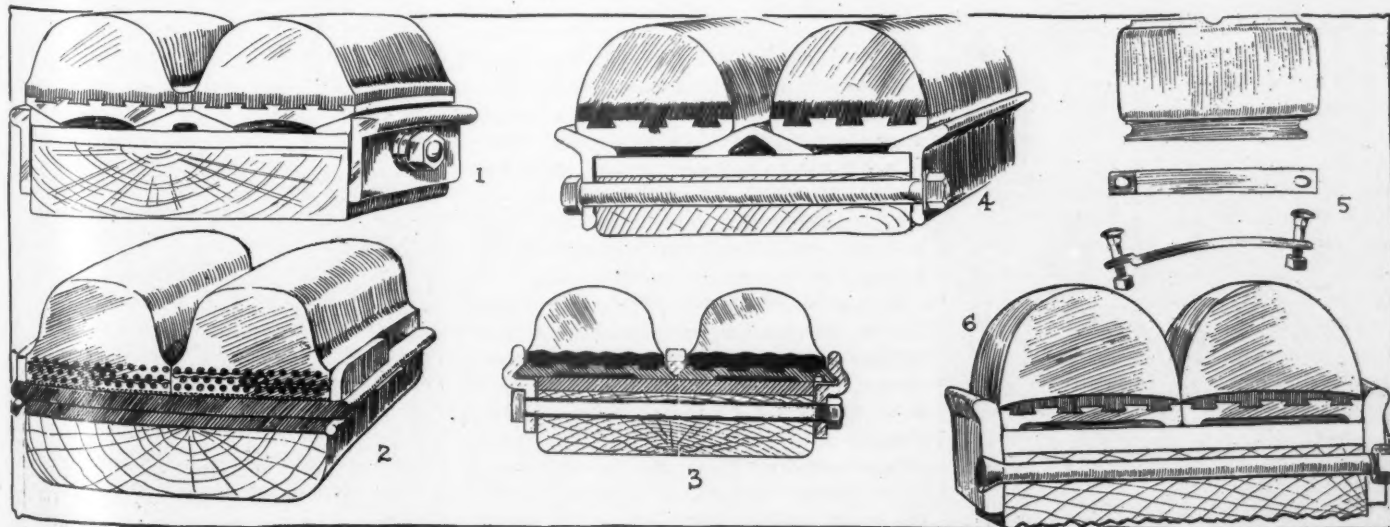
Republic—There have been two changes in the line of Republic tires for commercial vehicle service during the past year. The continuous solid tire for clincher rims has been a feature of Republic construction for some time and has been continued with a slight change as to construction. This change consists in the use of a semi-hard base through which the transverse rods pass instead of having the entire tire of the same material. The use of the new semi-hard sub-base prevents damage from wear by the transverse wires and clincher rims. The new tire in the Republic line is a cushion tire with the Republic staggered tread. This tire has been developed for use with light commercial cars and electric vehicles and the anti-skidding feature is obtained by the use of

two rows of the knobs which are characteristic of Republic treads. The solid tires referred to above can be removed from the rims by taking off the side flange which is bolted through the felloe. It is made in either single or dual; in the latter case provided with a central ring. Pneumatic tires in both single and dual forms are supplied for trucks up to 1½ tons capacity and for fire department and other municipal service.

Swinehart—Three types of truck tires are included in the Swinehart line. These embrace a solid endless quick-attachable bolted-on flange truck tire, anti-skid cushion cellular tire and a clincher solid for light delivery, electric and motor buggy service. In the bolted-on flange type of solid tires, the base of the tire is gripped by the clincher side flanges, the base is reinforced by numerous cross wires embedded in it with their ends protected by several layers of fabric. There are no internal or side circumferential wires to make the tire rigid, so it can be easily slipped into the band and fastened by bolting on the side flange. The cellular tire is the design in which the regular construction is followed in fastening, although the tread is higher and wider. The tread is perforated with numerous half-inch cells extending almost to the fastening device at an angle of 45 degrees. These cells are said to prevent skidding by a vacuum effect, increase the resiliency by providing a space for the rubber to flow into under compression and permit the escape of internal heat. In the field of pneumatics there has just been brought out in the Swinehart line a new non-skid tread for use in light commercial work as well as on pleasure cars. This is called the Keaton tread. The non-skid effect is obtained by depressing a diamond shape groove in the tread of regular smooth tire. In the center of this design is a circumferential groove which is intended to hold the tire in a true course and, together with the many angles of the diamond

depression, prevent skidding on wet and slippery pavements.

United States Tires—A recent addition to the line of truck tires of the United States Tire Co. is the new demountable solid tire designed to permit quick replacement of either single or dual tires without removing the wheel or putting the truck out of service for more than a few minutes. The inside diameter of the tire band is ¾-inch larger than the outside diameter of the wheel. This gives a clearance between the tire band and the felloe band of 3-16-inch all around its circumference which is claimed to make it impossible for tire band and felloe band to rust or freeze together. Into this open space are forced wedges which are part of the flange ring. The top of the wedges come into contact with the corresponding bevel on the under side of the tire band, forming a seat and giving a metal-to-metal contact of about ¼-inch on both sides of the tire. They are forced into position by tightening the bolts which run through the felloe. The action of the weight on the tire is to press the flange wedge directly under the wheel band and as it has a flat seat there, the tendency to spread the band is negligible. Equipment for a single tire is an outer flanged wedge, an inner flanged wedge and nine, twelve or fifteen bolts depending upon the size of the wheel. Equipment for a dual wheel is the same except that in addition to the wedge flanges it has a center wedge ring. The holes through the flange for the bolts are elliptical to permit of variation in circumference of the wheel. The tire itself is made the same as the Continental solid motor tire, made in Germany. It is built on a steel band with a layer of hard rubber between the band and the soft rubber tread. The band is dovetailed to form a seat for the hard rubber, and the tread is vulcanized on to this. The tire is built in accordance with the sizes adopted as standard by the Society of Automobile Engineers.



TYPES OF DUAL SOLID TIRES FOR HEAVY DUTY

1, Goodyear Solid Dual Demountable; 2, Diamond Dual Removable; 3, Goodrich Dual Demountable; 4, United States Solid Twin Tire and Demountable Rim; 5, Portage Individual Removable Block; 6, Gibney Twin Solid

Trend of the Year in Radiator Design

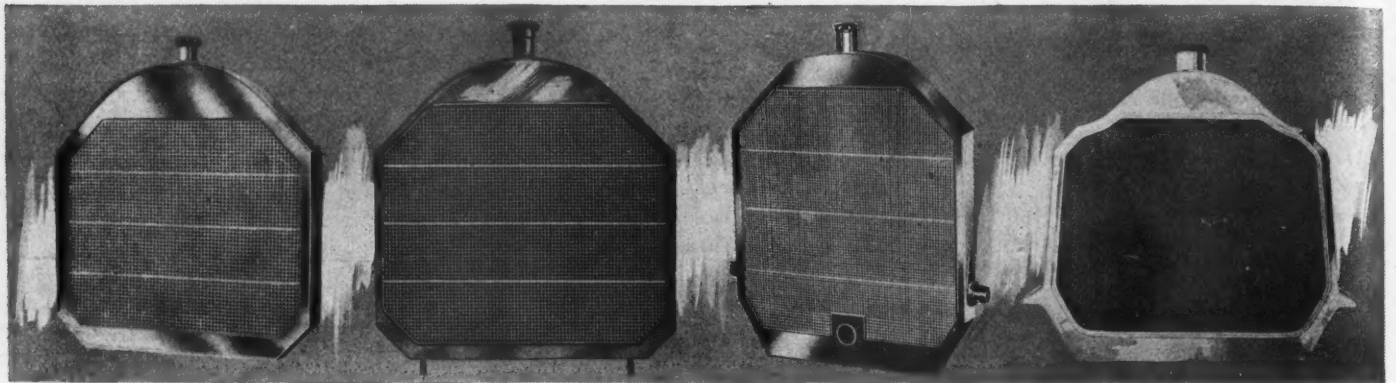


FIG. 1—BRISCOE TUBULAR

FEDDERS GENUINE CELLULAR

LONG TUBULAR

McCORD TUBULAR

Statistics Show Cellular Type Leads With Passenger Car Makers and Tubular on Commercial Vehicles

THERE are in use on motor cars today two distinct types of radiators, tubular types and cellular types. Tubular types, are those whose water passages are comprised of long, separate, well defined channels; while the cellular types are those in which the water is free to travel entirely around a series of air cells formed by the walls of tubes arranged side by side and separated from each other for the greater part of their length.

According to the specifications of the motor car manufacturers of the United States, there is approximately 15 per cent more cellular than tubular types of radiators used on pleasure cars, and 20 per cent more tubular than cellular types used on commercial cars. Owing to the misunderstanding, intentional or unintentional, on the part of car makers, however, as to what really constitutes a cellular and a tubular radiator, many motor car makers specify their radiators as being cellular, when they are simply some form of tubular design having a cellular appearance. In the descriptions to follow, in order not to confuse, tubular radiators having a cellular appearance will be termed tubular radiators of cellular type, and real cellular radiators will be termed genuine cellular radiators.

McCord — The McCord company has brought out for the season of 1912 a new cellular design of flat tube radiator, whose construction is shown in Fig. 6. It consists of a series of vertical metallic strips crimped and pressed into $\frac{1}{4}$ -inch squares and separated by flat strips with the edges so formed as to maintain a proper water space between them. The water circulates vertically, but the water pockets in the horizontal folds of the crimped sections add considerably to the volume of

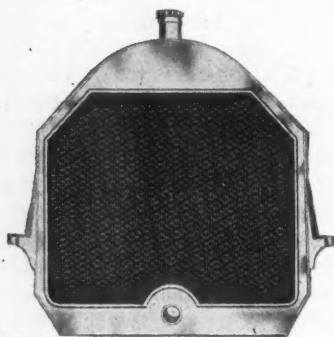
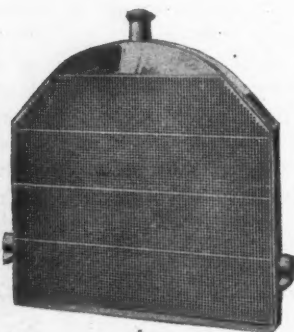


FIG. 2—HARRISON TUBULAR



A-Z TUBULAR

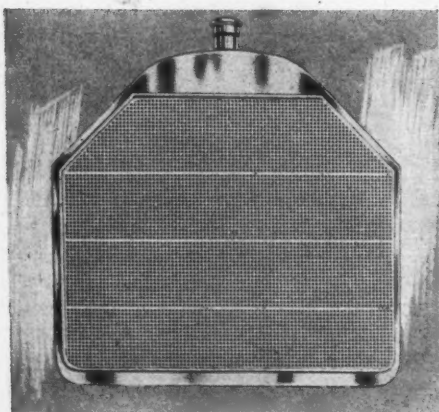


FIG. 3—BUSH RADIATOR

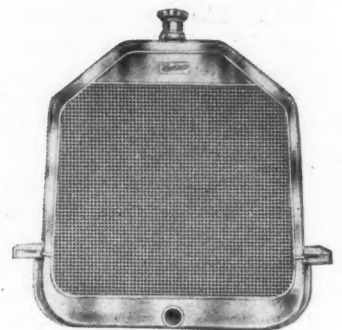
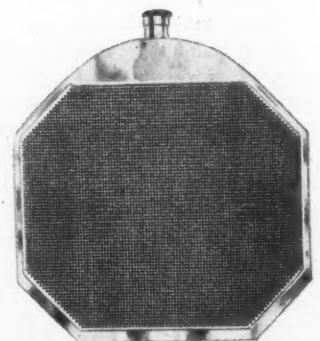


FIG. 4—LIVINGSTON TUBULAR



MAYO TUBULAR

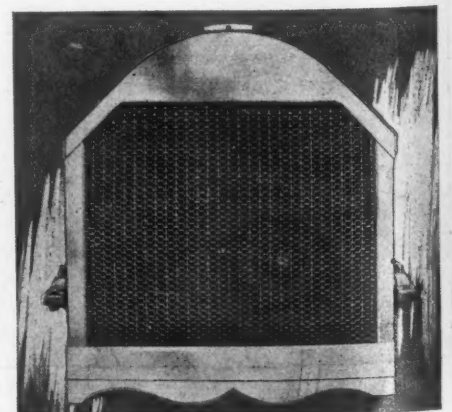


FIG. 5—T-A-R VERTICAL TUBE

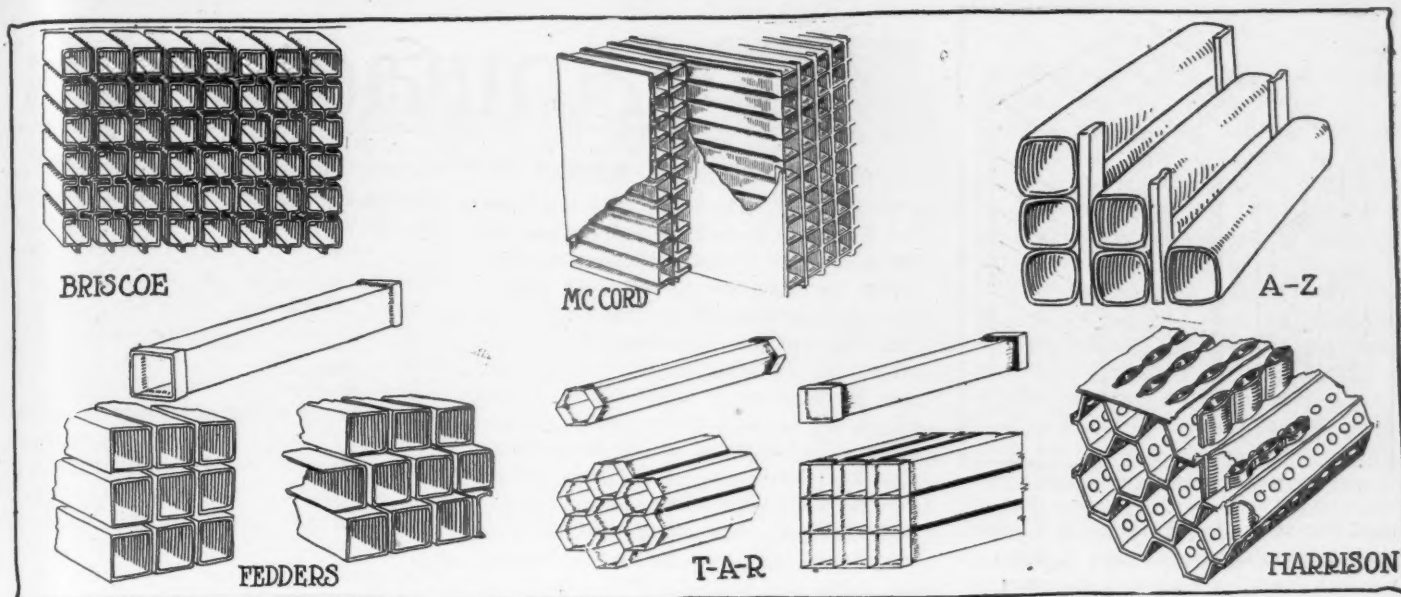


FIG. 6—SHOWING CONSTRUCTIONS OF VARIOUS CELLULAR AND TUBULAR RADIATORS

water contained in the radiator and the radiating qualities thereof. The McCord vertical tube radiator is made of a vast number of cylindrical vertical tubes connecting between water tanks above and below. Broad horizontal copper strips arranged about $\frac{1}{4}$ inch apart or less and extending horizontally from side to side of the radiator are pierced by the cylindrical water tubes.

Fedders—Several different types of radiators are made by the Fedders Mfg. Works, but the feature of the line is a genuine cellular or square-tube design. Fedders square tube radiators are made up from a vast number of pure copper tubes so arranged that all four sides of the tubes come in direct contact with the water, or in other words, every tube or unit is entirely surrounded by water which is free to flow past any one of the four sides. Fedders square tube radiators are furnished with the tubes staggered as at the right in

Fig. 6, or with the tubes arranged one above the other in a straight line, as shown at the left. The staggered construction, on account of lateral as well as vertical circulation, is somewhat more efficient than the straight line design.

Briscoe—A cellular type of vertical tube radiator is one of the features of the Briscoe line. As shown in Fig. 6, it is so constructed that the water in passing through the radiator flows almost entirely around the tubes. The simplicity and strength of this construction together with its manufacturing advantages and efficiency are its main features. The tubes are squared and held firmly by a strip of brass that forms the water space, and when soldered together makes a strong and durable body.

Mayo—Mayo radiators are of a light, vertical, flat tube design of cellular type, that is, the water circulating channels are comprised either of straight or zigzagged flat, vertical tubes which, when assembled, give the radiator a cellular appearance. There are three types of the Mayo radiator. The standard type comprises zigzag vertical tubes in which the air cells are almost entirely surrounded by water. In this construction the length of the vertical tube is considerably greater than that of the other two styles or types, in which the tubes are absolutely straight from top to bottom; hence the cooling efficiency of this type of radiator is greater than that of the other types. The other types are known as the wireless type and the honeycomb type.

Harrison—Harrison radiators are of the vertical tube type in which the vertical tubes are made up of two corrugated strips soldered together to form a series of long vertical channels, as shown at the right in Fig. 6. These strips are soldered together at their outer edges only and where they come together at adjacent tubes. Perforated copper fins so formed as to give a regular hexagonal cellular appearance separate the banks of vertical tubes and increase the radiating efficiency. For

the season of 1912 the Harrison Radiator Co. has brought out a lighter design of radiator similar in construction to the heavier truck types, but with smaller hexagons and correspondingly smaller tubes.

Kinwood—Kinwood radiators, which are made by the Kinzie Mfg. Co., are of the vertical flat tube type having a cellular appearance. The tubes are flat without crease or crimp and arranged in a vertical position. The radiator fins have a flat soldered contact with the tubes so that they cannot cut them; the water space in all tubes is $\frac{3}{32}$ inch wide, extending from front to back, and it is claimed that the construction of the tubes and water boxes is such that the radiator can freeze without serious results. A feature of the Kinwood radiator is that all seams and joints are accessible, which makes it easy to repair in case of damage.

Long—Long radiators are made in a series of tubular designs, including a ver-

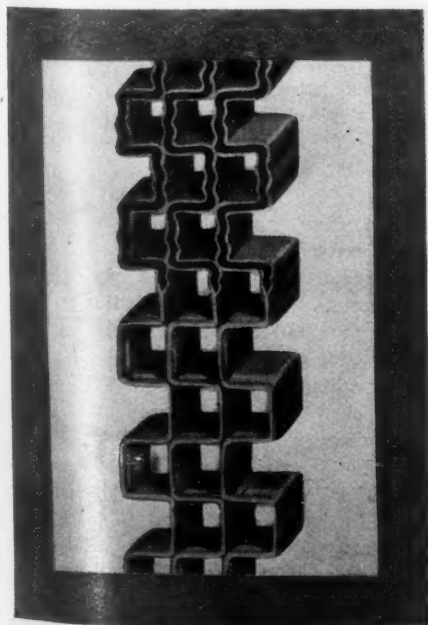


FIG. 7—LIVINGSTON TUBULAR

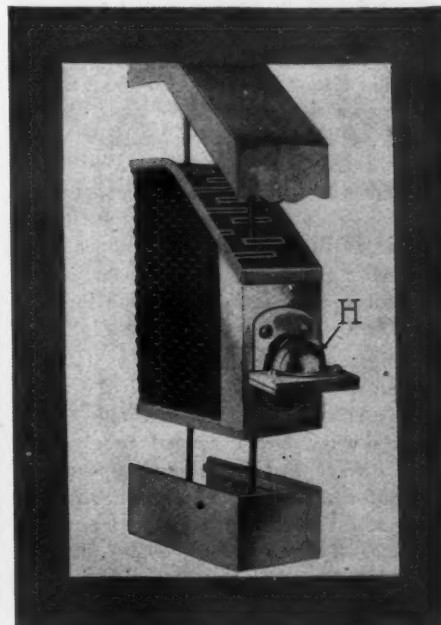
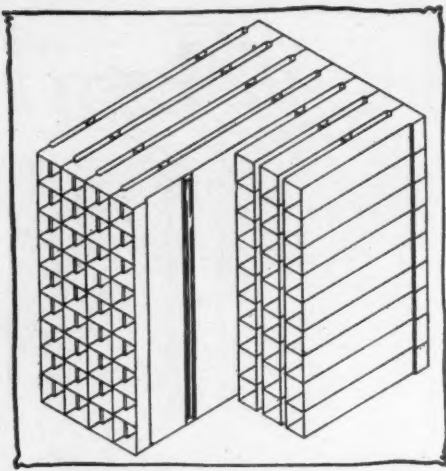


FIG. 8—T-A-R, BALL AND SOCKET H



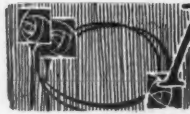
SECTION OF KINWOOD RADIATOR

tical flat tube design, having a diamond-shaped cellular appearance in front, a vertical flat tube type with a square cellular effect in front, and a round tube pattern with continuous horizontal corrugated fins. In the square tube cellular design the water is conveyed from top to bottom through flat vertical tubes, with a transverse flow at three divisions extending horizontally from side to side across the radiator.

A-Z Radiator—The A-Z radiator is a vertical tube design having a cellular outward appearance. It is comprised of a series of vertical rows of square air tubes with spacers consisting of strips of brass separating each row on either side and in front and back. The strips or spacers form the water channels. As the tubes rest snugly one upon the other, there is no horizontal space between them; therefore the water channels are like unto a straight vertical tube. The radiator is divided into sections, however, and there is a horizontal flow between the four horizontal sections.

T-A-R—The distinctive feature of the Take Apart Radiator Co.'s radiators is that they may be readily taken apart for the purpose of cleaning or repairs, and as easily put together again. T-A-R radiators are made either in tubular or genuine cellular types as desired. In the vertical tube types the tubes form straight water channels from the top to bottom tanks, and pass through sections of copper fins which give the flat tube radiators either a hexagonal or square cellular appearance. A feature of the T-A-R radiator is the ball and socket design of mounting employed, which is shown at H in Fig. 8.

Livingston—The Livingston radiator is a zigzag flat tube type in which the water flows from top to bottom, through zigzag channels which are arranged to give the radiator a square tube cellular appearance. The water flows alternately horizontally and vertically throughout the length of the tube. In this design, Fig. 7, no fins are required, and the construction is such that the tubes are of three times the length of the tubes in a straight vertical tube design.



Manufacturers'

REGARDING WIRE WHEELS

COVENTRY, Eng.—Editor Motor Age—Now that the wire wheel has asserted its superiority it is inevitable that other forms than the Rudge-Whitworth detachable wire wheel will be marketed. No one firm can possibly secure a complete monopoly, but with several firms making wire wheels there is great danger to the wire wheel movement; for a failure of one make of wire wheel is not unnaturally placed at the door of all wire wheel makers. The same thing occurred in the early days of wire wheels, which were contemporaneous with the early days of the motor car itself.

The motor engineer knew that wire wheels, because of their extreme lightness for a given strength, had proved themselves the only possible wheels for bicycles and tricycles. The latter are just as important to my argument because in them alone were present the large side strains that play so important a part in motor car wheels. Most motor engineers took the bicycle wheel and thickened up the spokes because of the greater weight of a car. Some borrowed so badly from cycle practice as to use direct spokes, ignoring the beautiful work that had been done in the development of the tangent wheel.

The Lanchester Motor Co. was quite moderate in its increase of the spoke diameter and had from the start practically no wheel trouble whatever. This was not pure luck. The Lanchesters were closely in touch with the cycle trade and with those in it who took a deep interest in the theoretical side of its development. They knew much of the true inwardness of the suspension wheel, the proper balance of strength between the hub spokes and rim and they were quite alive to the folly of making the spokes so strong that they would be very little stretched by any tension that the section of the rim would permit, and that in consequence the slightest deflection of the rim due to load would permit the spoke tension to reach zero and the nipple heads to leave their seats; and, as the wheel revolved, return to them with a shock that would soon render the whole wheel loose and eventually snap off the spokes at their weakest place, either the bend or the thread.

Some other designers of wheels did not know this and wire wheel failures were so frequent that the whole system became discredited and even the Lanchester company had the greatest difficulty in continuing the use of the wire wheel. Indeed, it was forced to market an artillery wheel as an alternative and possibly would have been compelled to abandon the wire wheel altogether had not the Rudge-Whit-

worth Co. begun to make wire wheels on sound and even much improved lines for the whole motor car trade. Among the early users of Rudge-Whitworth fixed wheels, beginning in 1905, were the Napier, Lanchester, Rolls-Royce, Arrol-Johnston, James & Brown, Vinot, Hotchkiss.

In those days the Rudge-Whitworth Co. employed sixty spokes of 8-gauge at the two ends and 10-gauge in the length between, nothing stronger would stand for the reasons set out above. It was recognized that stronger spokes would make a stronger wheel, but unless the other parts were made far stronger there would result a wheel far less durable, because a very yielding length of spoke alone could prevent the forces due to shock from reaching such high limits as would destroy such parts as the nipples and the seating of the same in the rims. The use of steel nipples with a special shape of head placed the nipple outside the category of weak links and a thickening up of the rim where the nipples fitted removed the rim weakness also; and so, proceeding carefully step by step, the Rudge-Whitworth Co. is now able to use spokes of far greater strength—.187-inch swaged down to .155-inch and still retain the great length of the small section as the weakest and yielding part of the wheel.

There is much in the way of special spoke bends, special spoke heads and special methods of producing the seating for the nipples in the rims that has brought about this result. Some of these things are subject matter of letters patent, some are mere shop knowledge, difficult to get at because unpublished and unpublishable, and some probably are only attainable by close control both chemical and physical in the laboratory, but the great essential for a durable wire wheel is to have the spokes as strong as possible and yet have them weaker than anything else in the wheel and weaker over a great length. It is quite easy to make a wire wheel strong by ignoring this essential point, but such a wheel will not endure and it will bring discredit on wire wheels generally.

I have purposely kept off any question of patents. I believe that the Rudge-Whitworth patented system of dished wheels, both double and triple-spoked, make wheels better suited to their employment on a motor car, but these if made not in accordance with the proper relation of spoke and rim strength would be bad, just as any other system ignoring this relation would be bad, and I write this letter to draw attention to this most vital point and thus prevent a repetition of past setbacks to which the wire wheel movement has been subjected.—John V. Pugh, Rudge-Whitworth, Ltd.

Communications

RECORDING ROAD SHOCKS

NEW YORK—Editor Motor Age—After a car has been equipped with a set of shock preventers it generally is sent out on a rough road to try the action of the new device and make any necessary change in the adjustment. Should the car ride too hard the adjustment of the absorbers is eased and the car tried again until a satisfactory setting is obtained. What constitutes a proper setting is a matter of personal opinion and varies considerably. However, the improvement in the riding of the car is great and the range of satisfactory adjustment so large that very little time is expended on attempting a really close setting.

Shock preventers generally are adjusted in pairs unless some great difference is noticed. The front ones are adjusted equally hard or soft and the rear ones treated alike. Little or no attention is paid to any one absorber unless its mate is considered.

The Mondex preventer testing machine was designed to record the resistance offered by a shock preventer at different points of opening and closing. A car may be fitted with Mondex preventers and given a road test in order to adjust the preventers. After the most satisfactory road adjustment has been found the preventers are taken off and recorded on the testing machine. Suppose the right front preventer records a resistance of 130 pounds to an opening of 6 inches while the left front records an effort of but 100 pounds for the same distance of opening. Then both preventers are adjusted to give an average resistance of 115 pounds at an opening of 6 inches. The rear preventers are treated the same with regard to one another, but without any consideration to the setting of the front preventers. The balance of the car may be such that the front preventers would have to do almost all the work to keep the car steady owing to the distribution of the weight on the front and rear wheels.

Only on cars where heavy extra tires

on spare rims and heavy tool boxes are carried on the side of the car is it necessary to consider the adjustment of both right or both left absorbers.

When a car of one make and model has been equipped and road tested and a record has been made of the actual setting of the absorbers, it is possible to adjust another set of preventers to the same resisting effort and thereby install them on a car of the same make and model without the necessity of a road test. In fact, the most practical driver could not obtain a better adjustment.

As the Mondex preventers are lubricated and their resisting effort depends on the compression of a rubber disk, the ever varying coefficient of friction is eliminated, therefore once adjusted they retain their even resisting effort throughout continued use.

The neutral zone of the Mondex preventer is the limits of movement of the preventer within which no resistance is offered. In other words, when a car is running over smooth pavement there is a certain amount of axle vibration which should not be resisted or transmitted to the frame of the car. However, when the springs move beyond this point, resistance is offered which increases with the amplitude of the movement. When the spring starts to return to its normal position no resistance is offered unless it should pass the neutral zone when its movement is again resisted. The amount of this resistance depends entirely upon the setting of the preventer, which in turn depends on the weight and spring action which it is made to resist.

The Mondex testing machine is used to measure the effort of a preventer in order that others may be set to equal adjustment.—Aristos Co.

TO SELL GUAYULE CONCESSION

Austin, Texas, Feb. 3—Another sale soon will be made by the state of Texas of all the guayule rubber shrub now growing upon its public lands. If anything like the market price of the shrub is ob-

tained the price to be paid will be several hundred thousand dollars. Bids for the purchase of the shrub will be received by the state land commissioner, J. T. Robison, up to March 14. The shrub will be sold to the highest bidder. The state land department made the first sale of the guayule shrub upon state lands 5 years ago, the total consideration at that time being \$61,000. The period that the shrub could be gathered was 4 years, and it expired a year ago, the ungathered shrub again becoming the property of the state.

It is stated by persons who have been over the several million acres of state lands upon which the guayule shrub grows that it exists in enormous quantities in many localities and that the cut-over lands are being rapidly recovered by the valuable growth. Where the shrub was cut 3 or 4 years ago the new growth is now of a marketable size.

The shrub which was gathered under the first sale by the state was used in the rubber manufacturing plant at Marathon, Texas. This is the only rubber factory in the United States. It turns out large quantities of crude guayule rubber which is marketed in New York where it enters largely into the manufacture of motor car tires.

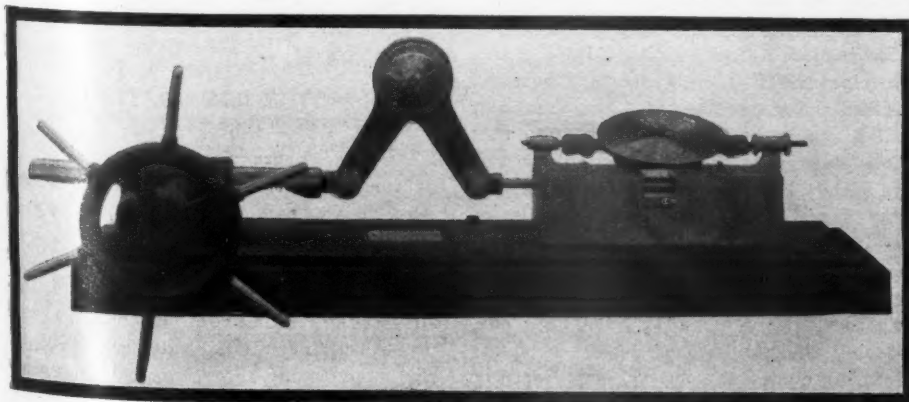
The guayule shrub has sold for as high as \$150 per ton since the discovery was made a few years ago of its valuable rubber properties. It is not expected, however, that the state will receive bids to buy it at anything like that price. If it is sold on the tonnage basis, even as low as \$20 per ton, it would bring a revenue of several million dollars. When it was sold 5 years ago for \$61,000 little was known of its value. The shrub grows upon semi-arid land in the upper border region of the state. This land is practically worthless for all other purposes.

TO HELP TRUCK PURCHASERS

Boston, Mass., Feb. 6—Plans have been under way in Boston for some weeks to organize the Motor Truck and Tire Board of Trade, the purpose being to assist the buyer and user of motor trucks; to give sound advice to prospective customers and users, and to improve the selling end of the business by eliminating the unsound methods that are sometimes used. H. L. Stockbridge, of the Polack Tire Co., has been chosen temporary chairman of the meetings, with Day Baker, manager of the Boston branch of the General Vehicle Co., as secretary.

BISONS ELECT OFFICERS

Buffalo, N. Y., Feb. 7—George Ostendorf, of Buffalo, was elected president of the Buffalo Automobile Trade Association at a meeting of the board of directors of that organization last week. Other officers chosen by the directors were: Vice-president, William R. Densmore; secretary, Gustave C. Miller, and treasurer, E. C. Bull.



MONDEX DEVICE FOR RECORDING ROAD SHOCKS

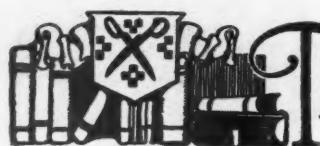
S. A. E. HORSEPOWER RATING

Ohioan Objects to Present Formula for Rating Engines

GREENVILLE, O.—Editor Motor Age—We are having a great deal of controversy since the issue of the Motor Age of January 4, which gives the S. A. E. rating of different motor cars. We notice in this rating that the horsepower is figured the same on the 4 by 4 motor as it is on the 4 by 4½ motor, which is surely wrong, and the 3¾ by 4 is rated within the 3 horsepower of one which is a 4 by 4½. We think Motor Age is doing a great injustice to the motor proposition by giving a rating of this kind, as the stroke of the motor really is more essential than the bore so far as the power is concerned. In one instance we notice that a 3¾ bore by 5½ inch stroke is rated at 16.9 horsepower, which is simply ridiculous.—S. H. Swope.

The rating given in the tables to which you refer is, and has been for the past 8 years, the standard horsepower rating in America, in Great Britain and in France. This, until last year, was known in America as the A. L. A. M. rating, but is now called the S. A. E. rating, and is obtained from the official formula of the Society of Automobile Engineers. As you say, the stroke is not taken into consideration directly in determining the horsepower rating of the motor by this formula, but it is considered indirectly. This rating is obtained by squaring the diameter of the bore, multiplying by the number of cylinders of the motor and dividing the product by 2.5. It is obvious, therefore, that all motors of the same number of cylinders and same diameter of cylinder bore will be rated the same, no matter what their stroke or speed—two factors which really effect actual horsepower delivered. The series of tests upon which the formula was determined showed that it gave good average results with motors having a piston speed of 1,000 feet per minute; and further, that nearly all the commercial motors were designed for this speed no matter what their stroke. That is, the motors having the longer stroke rotated less rapidly so that the distance traveled by the piston was approximately 1,000 feet in each minute. Therefore, both the speed of the motor and its stroke are indirectly considered in this formula. That this formula does not give fair results in all cases is admitted, and that the rating is not entirely fair for the present long-stroke motor is also granted.

Nevertheless, there are other factors which have as great a bearing upon the horsepower of a motor as the stroke and speed of revolution, and these are points of design, such as valve diameter, valve lift and weight and balance of moving parts, for which no adequate formula could be devised. The British engineers have been attempting for several years to devise a formula which would give almost



The Readers'

Motor Rating Formula Causes Discussion—Long-Stroke Motors Responsible for Dissatisfaction with Method Adopted by Society of Automobile Engineers

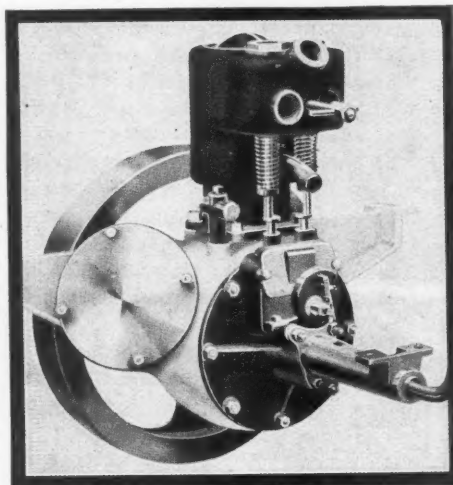


FIG. 1—BRUSH SINGLE-CYLINDER MOTOR

exact results for all designs and sizes of motors, but so far have been unsuccessful. Several formulae have been proposed which very nearly fulfilled the conditions required, but they are so cumbersome and have so many varying factors they are too complicated for the ordinary man to employ.

Since, then, it is impracticable to employ a formula which will give exact results, the Society of Automobile Engineers, whose formulae and specifications are accepted as standard by the motor car industry, believes that the best formula is the one which gives fair results in the average cases, and is at the same time simple enough to be universally understood and used. If you have a horsepower formula which will give exact rating for all motors, Motor Age will be very glad to publish it.

MAKERS' ADVICE SOUGHT

Indianapolis, Ind.—Editor Motor Age—Through the Readers' Clearing House, I noticed the statements of A. D. Carpenter and a reader in Port Gibson, Miss., that their experience with retreading by vulcanization has been very unsatisfactory. Why don't some of the manufacturers of tire repairing devices tell through Motor Age's columns what was the probable cause of this repairing having been satisfactory. My son and I have been considering the purchase of a very complete repairing equipment, but the experience of these men is not a bit encouraging.—John A. Fidler.

POWER FORMULA SUGGESTED

Michigan Man Offers Addition to Accepted Statement

GRAND RAPIDS, Mich.—Editor Motor Age—In the issue of January 18, P. S. Brown, of Emmetsburg, La., asks for a good method of figuring horsepower.

The A. L. A. M. formula is given as the accepted method and the reader is given to infer that the stroke is of no consequence and in fact no use is made of it in the example. Let us now suppose the example should read 5 by 3 motor, our horsepower is still 40. Let it be a 5 by 1 motor, yet we have 40 horsepower and finally a 5 by 0 has 40 horsepower, but how is one to get it out of the beast?

I am not criticising Motor Age as this

formula is invariably stated $HP = \frac{D^2 \times N}{2.5}$

How does this look? $HP = \frac{D^2 \times N}{2.5}$

per 1,000 feet piston travel—E. P. Medd.

The A. L. A. M., or more properly the S. A. E. formula, is open to criticism in these days of long-stroke motors, and you are correct in assuming the absurdity of a 5 by 1 motor giving 40 horsepower. As stated in the reply referred to, the formula is based on a piston speed of 1,000 feet per minute, which indirectly takes the stroke into consideration as shown in this issue in reply to the communication of S. H. Swope, Greenville, O.

The formula you suggest would be more nearly correct and would conform with the intent of the Society of Automobile Engineers if it were changed to read

$HP = \frac{D^2 \times N}{2.5}$ per 1,000 feet per minute piston travel

BRUSH MOTOR ILLUSTRATED

Xenia, Ohio—Editor Motor Age—Will Motor Age please furnish an illustration of the Brush runabout, model D, motor? Also please recommend a good, reliable motor car tire.—Elmer Wolfe.

The Brush motor is illustrated in Fig. 1. Any of the tires described in the advertising columns of Motor Age will prove reliable. It is not the policy of this department to recommend one make above another. If the makers' instructions are followed all should be satisfactory.

Clearing House

Suppression of Noise Idea of One Reader in Combining Two-Cycle and Four-Cycle Principles—Subscriber Finds Retreaded Tires Poor Economy

DESIGNS NOISELESS MOTOR

Frank E. Baker Suggests New Type of Engine for Silent Operation

ROYAL OAK, Mich.—Editor Motor Age—There being a growing demand for a silent engine for motor car use, and an effort on the part of designers to fill the demand, a few remarks on the subject might be of interest. It seems that the poppet valve necessarily must be noisy, at least when running at high speed, because of the sudden seating of the valve. Rotary valves, sliding sleeves and the like accomplish the desired result but increase the complications and create new difficulties, such as preventing their leaking and giving them proper oiling.

The two-cycle engine has no valve mechanism and in so far as the valves are concerned must be noiseless. There have been many firm advocates of the two-cycle engine in years past and some of their contentions have been conceded, but for motor cars their use has been limited. The one great objection has been that when throttled and working at partial load, their action was irregular and jerky. This irregularity of course was hard on the transmission even when heavy flywheels were used. Now it seems that this fault of the two-cycle could be overcome, and if so we would have an engine superior to anything now on the market.

In examining the action of the four-cycle engine it will be seen readily that after an explosion most of the burned gases are driven out by the upward stroke of the piston and but little remains in the cylinders at the commencement of the intake stroke. The new charge mixing with what little burned remains in the cylinders is readily ignited. When the engine is throttled there is the same expulsion of the burned gas but with a smaller charge admitted to the cylinder. The mixing now of the burned gas with the fresh gas makes a weaker mixture and the engine would misfire if it were not that the carburetor compensates for it by closing the auxiliary air valve or in other words by increasing the richness of the gas as it leaves the carburetor.

With the two-cycle engine the remaining burned gas after an explosion is somewhat less when the engine is working at full capacity. But throttle the two-cycle and the incoming gas is decreased in quantity and the burned gas is increased

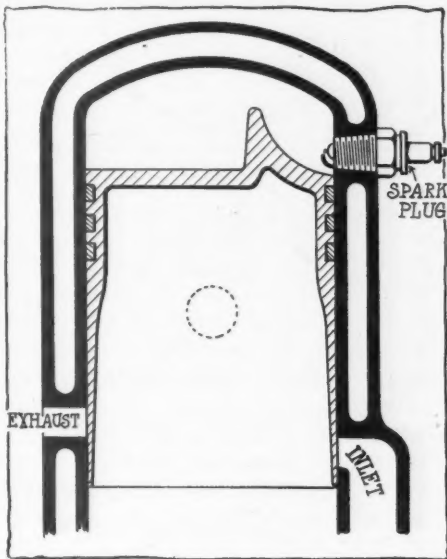


FIG. 2—DESIGN OF NOISELESS MOTOR

in quantity, which makes the resultant mixture too poor to fire.

My idea would be to practically divide the cylinder into two chambers, injecting the gas into one in which the spark plug is located and when the engine is working under full load both chambers would be filled by the overflow from the first chamber. The result of this would be to keep the mixture in the first chamber nearly uniform at all loads and consequently give a steady running engine with all the flexibility of the four-cycle, plus silence.—Frank E. Baker.

AGAINST RETREADING

Washington, D. C.—Editor Motor Age—On page 34 of the January 18, 1912, issue of Motor Age I read A. D. Carpenter's letter on retreading. I am also a 7-year-old tire-trouble victim. I have had several retreads and found that it was money wasted. If my tires wear to the retread condition I have found that it is wiser and more economical to take the retread price and add the difference to it for a new case. Then one can sit in the car without fear of a sudden blow-out.—John A. Schneider.

LACK OF COMPRESSION TROUBLE

Chicago—Editor Motor Age—In regard to the Pennsylvania man's trouble with the 1910 Chalmers, told in Motor Age of January 18, page 33, I went through the same mill. Let him bring up his compression in the weak cylinder—probably No. 3—and his trouble will be gone.—Dr. Soeeth.

BELIEVES IN HEAVY CARS

Washington Subscriber Makes Comparisons of Weight and Load

DIXIE, Wash.—Editor Motor Age—In answer to the correspondence written by J. J. Jones, of Wichita, Kan., in the Readers' Clearing House of Motor Age of January 25, I should like to put in a few words in regard to the subject "Pleads for Light Weight."

First we will take the bicycle, which is lighter than the man it carries, but the man furnishes the power, so it would be a very hard matter to make a comparison between the bicycle and the motor car.

The farm wagon would have to be built many times heavier than it is if it were to haul its load over the rough roads at the speed that a motor car travels, and still more the weight of the horses must be considered, so I think this settles it for the wagon. Now, as for the carriage, we can add the weight of the two horses at about 1,100 pounds each, which would be about right and the four-passenger carriage at 800, making 3,000 pounds in all. Now, my car is a five-passenger and it weighs 3,400 pounds, which is a little heavier than the average. This would about equal the carriage if they ran at the same speed, but my car must go many times faster than the carriage, and very often it hauls seven or eight or nine persons, and we all know it takes weight to get strength which must be had in a motor car.

Next comes the motor cycle, which generally weighs about 250 pounds and is made to carry one person but will carry two small ones, which would be about the same weight as the machine itself and if this would be made heavy enough to stand the knocks and bumps that a motor car must stand and be provided with as much comfort, it would certainly be as heavy as the motor car according to the load it carries.

I do not believe in carrying sand bags in order to get weight and easy riding, but I think that the present car is none too heavy to have the strength that is needed.

To sum the whole thing up, the heavy car does not take many more tires and in the long run the upkeep would be much less on the heavy car which is strong enough to stand the wear and tear that it must stand. And lastly the matter of safety which is certainly in favor of the heavy car, and this is something which must be considered in the building of motor cars.

As our highways are improved, the matter of weight is less important every year. This is proven by the foreign cars which, I understand it, are about 125 or 150 pounds to the horsepower and in our country less than 100 pounds. I think, however, that the foreigners do not build cars better than we do. I think we lead the world in the motor car industry as in nearly everything else.—Paul Thonney.

Air Starter Design

Size of Distributer for Pneumatic Starter Given

ELWOOD, Ind.—Editor Motor Age—I have been contemplating installing a starter on my $4\frac{1}{2}$ by 5 four-cylinder motor and would like some assistance. I am inclosing a rough sketch showing parts of air distributor and would like to have advice as to what is the proper dimensions for the details I have shown, particularly the circle diameter of the four ports, size of ports and length of oblong port in moving sector for said size motor. I also would like to know at what position in degrees the crankshaft would be past upward vertical position when the edge of the port in the sector should be on edge of the port in the body of the distributor. Would a tank the same size as the Prest-O-Lite tank be the right size for storage and what would be the advisable pressure to carry. In constructing a suitable air pump would a small two-cylinder affair with a high and low-pressure cylinder work satisfactorily so arranged that when a small pedal on the floor was pressed it would press two small fiber driving wheels against the face of the flywheel causing pump to operate only when necessary.—Subscriber.

The diameter of the port circle need not be over 3 inches. The dimensions of the ports in a distributor of this size are indicated in Fig. 3. The higher the air pressure employed the more difficulty you will have in preventing leakage. If a maximum of 150 pounds be carried this should give good results with careful construction. The tank should be about $1\frac{1}{2}$ times as large as the Prest-O-Lite tank. The distributor port should begin to open about 5 degrees beyond piston dead center. Your design is capable of giving satisfactory service and should start the motor, if correctly constructed, except when the motor is on dead center. You are referred to the description of the air starters in Motor Age for January 25.

NO AIR EXPLOSION

Spencer, Ia.—Editor Motor Age—I have a two-cylinder model F Ford car, fitted with Splitdorf coil, single vibrator, and use dry cells only; a model W Holley carbureter. Recently I have had trouble in starting the machine. There are very few explosions when cranking—one or two and sometimes three, and now there is scarcely any explosion. The vibrator has a good buzz. There seems to be air accumulation in the cylinders, or some where, so it is almost impossible to crank it until it explodes in the carbureter, not a fire but an air explosion. Then the engine turns easier for one or two turns, then the trouble occurs again and air explodes in the carbureter. Will Motor Age tell me what is the trouble and the remedy for same?—A Reader.

Very probably this is due to sticking

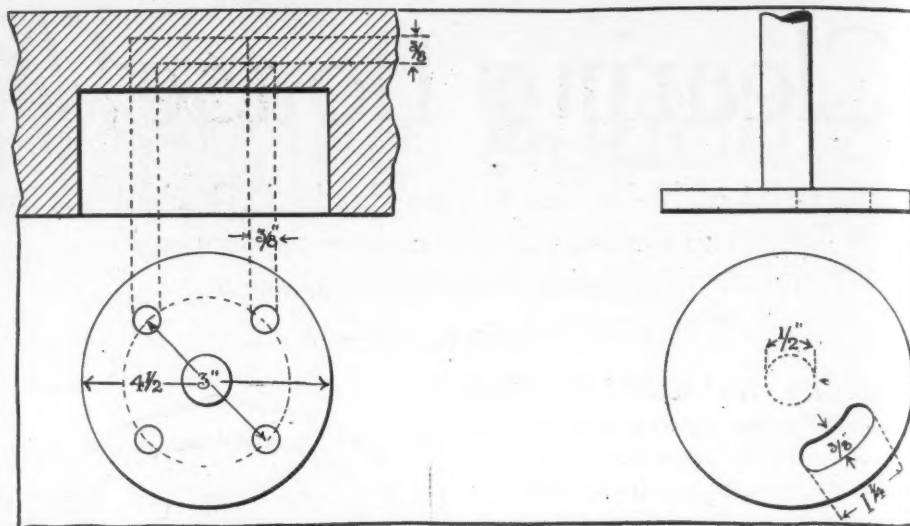


FIG. 3—SUGGESTED ARRANGEMENT OF DISTRIBUTER FOR AIR STARTER

exhaust valve. The valve stem may be bent or stick in the guide. Your air explosion theory is wrong. Air is not an explosive gas and unless the proper proportion of fuel gas be mixed with it will not explode in the muffler or elsewhere.

SHORT-CIRCUIT IN BATTERY WIRING

Muncie, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age please tell me why my car uses so much juice out of the dry cells. I have put in 3 sets and when taken out the tester showed only 5-10. The car is equipped with a Splitdorf magneto and it has not been run over 25 miles. The motor starts hard when it is cold.—R. G.

You do not say how long the dry batteries last and whether or not you use them only for starting. Look for short circuit in battery line, or in the switch, through which battery may be discharging itself.

TOO MUCH OIL

Chicago—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following:

1—Explain the difference between a universal rim, a quick demountable and a detachable rim, etc.

2—What is a pound-foot? How does it compare with a pound used in merchandise?

3—Explain the different types of progressive, selective and planetary transmissions.

4—I have a 1911 model T Ford and the two front cylinders or the spark plugs in the two front cylinders foul badly, and when running on slow speed the cylinders will miss, first one and then the other. Running on fast or high speed the engine runs well. In adjusting the coil a good spark was obtained at the plug; the oil in the reservoir has been lowered; a mechanic has looked over the valves to see if they seat properly. When the engine is running quite fast it seems to do very well, but when running slowly it misses badly in one cylinder, then in another. The cylinder next to the dash has always worked very well but the

two front cylinders foul the plugs badly.—Reader.

1—A demountable rim is a rim which with its tire may be taken from the wheel and replaced by another. A quick detachable rim is one from which the tire may be easily removed and on which it may be quickly replaced. A universal rim is one with which any type of casing, clincher, straightside, etc., may be used. The different types of demountable rims were illustrated and described in Motor Age, January 11, 1912, page 53.

2—The pound-foot, or as it is more usually called, the foot-pound, is the mechanical unit of energy, and is the energy required to raise a weight of 1 pound against the force of gravity to a height of 1 foot. The larger unit of work, the horsepower, is equal to 33,000 foot-pounds per minute.

3—This was explained and illustrated in the Readers' Clearing House, Motor Age for November 16, 1911.

4—The missing is due to fouled plugs which, in turn, is probably caused by excessive lubrication in the forward cylinders. Evidently the oil level was not lowered sufficiently. You must proceed with care in order not to lessen the oiling too much.

GAS PRODUCES POWER

Joliet, Ill.—Editor Motor Age—We have an argument here among the dealers and owners of motor cars in regard to motive power. The argument at point is whether the expansion in a driving motor is caused by the explosion of the gas or the burning of the gas. We will appreciate the expression of the views of Motor Age on this question.

The motive power is due to the explosion of the gas. The quicker the gas can be exploded the better. In explosion it is necessary for a rapid propagation of the flame, but it is not the burning that gives the power. If the burning gave the power then a slow burning rich mixture would be very powerful, whereas it is the opposite. In the explosion of gunpowder the power is due to the sudden

formation and expansion of gases into which the powder is converted by chemical energy. When gasoline is exploded the hydrogen and carbon in contact with the air are ignited and pass off in the form of invisible gases.

POWER PRODUCED BY VALVES

Leland, Ill.—Editor Motor Age—I am a subscriber for Motor Age and would like to have answered through the columns of the Readers' Clearing House, whether an engine with a 4-inch bore by 4½-inch stroke, with a 3¾-inch valve, will develop as much power as a 4-inch bore by 4½-inch stroke with a 2-inch valve—Frank Turk.

The motor with 3¾-inch valve will, all other conditions being equal, develop more power than that with the 2-inch valve. The power you obtain from a gasoline engine is largely dependable upon the amount of mixture you get into each cylinder for each explosion. With a 3¾-inch valve you should get a better explosive charge than with a 2-inch valve.

ETHER IN FUEL

Evansville, Ind.—Editor Motor Age—Will Motor Age through the Readers' Clearing House answer the following: What percentage of ether is used with gasoline for fuel in gasoline engines? Does it give more power because of its high gravity, and is it true that ether is used by racing drivers in their gasoline used in racing cars?—Barney.

The proportions of ether and gasoline usually employed are 3 ounces of ether to 5 gallons of gasoline. It vaporizes more easily than gasoline but does not materially increase the power. It makes the motor start more easily. It is not true that ether is used in sanctioned races. Even if it were permitted there would be little gain. There are two substances which may be introduced into the cylinder to increase the power, sal ammoniac and picric acid. But their use is dangerous and shortens the life of the motor, and is forbidden in officially sanctioned races.

A PECULIAR MISS

Jackson, Ala.—Editor Motor Age—I have an E-M-F 30 in which the wiring and magneto seem to be all right. The car runs all right on level ground but when on sidling or rough road it will stop; also the engine can be stopped by standing on the running board and tilting the car a little. I have looked for loose connections and they seem to be O. K. Whether the car is on the magneto or battery it will stop just the same by standing on the running board, but is all right when the car is level. What is the trouble and the remedy?—S. J. Vann.

One of two sources of trouble is responsible; either ignition or fuel line—that is evident. If you are certain there are no loose connections in the ignition system, it must be in the gasoline line. If this is the case, the motor will not stop immediately when one stands on the

running board, but will run a few moments until the fuel in the carburetor is exhausted—that is, unless the needle valve is loose, in which case it might be accidentally closed by tipping the car, but not by getting on the running board. Loose ignition connections is the most likely trouble. Have any other readers experienced similar trouble?

TYPES OF AXLES

Kirkwood, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Is Motor Age's answer to Mr. Langhorst's question regarding valve dimensions of the E-M-F 30 correct?

2—Is there any difference between a live and semi-floating axle?

3—What type of rear axle is used on the Hudson 33 and E-M-F 30?—G. A. Welch.

1—No, the valve diameter of the E-M-F 30 is 2¼ inches.

2—All axles in which power is transmitted to the driving wheels through the shafts in the axle are live axles. All single-chain and shaft-drive cars have live axles. Where the axle does not turn, as with side chain-driven cars the axle is dead or stationary. Live axles may be floating, semi-floating or three-quarter floating.

3—The Hudson 33 has a floating rear axle; the E-M-F a semi-floating rear axle.

BEGIN AT THE BOTTOM

Mason City, Ia.—Editor Motor Age—I want to learn the motor-car business from A to Z. I have not the money to take the high-priced courses. I have studied the principles of the cars and know the names of most of the parts. I have been nearly through high school. I am handy with tools and pretty good at figures. I am 17 years of age and live with my parents. I want to become a tester or demonstrator.—M. J. B.

The surest way is to get into the machine shop or assembly department of one of the factories in your home town, do the work assigned and keep your eyes and ears open. Meanwhile, study car construction in the books and trade periodicals. Hard work and attention to the details will land you eventually in the testing department. This is stock advice, but is the best.

NOTICE TO CORRESPONDENTS

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:
Dayton, O.—A Subscriber.
Racine, Wis.—A Reader.
Virginia, Ill.—
Isabrook, N. Dak.—A Subscriber.
Detroit—O. W. P.
Des Moines, Ia.—D. C. G.
These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communications will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

In Favor of Kerosene

Hoosier Finds Oil Gives No Trouble as Cooling Agent

FULTON, Ind.—Editor Motor Age—Through the Readers' Clearing House I wish to state what I think about the statement made in the January 18 issue of Motor Age in regard to kerosene as a cooling agent. I have been using kerosene this winter for cooling and will assert that I am more than pleased with it.

My car has a 4¼ by 5-inch motor; tubular radiator, fan, pump and holds 2½ gallons of cooling fluid. I keep the radiator three-fourths covered in order to keep the motor reasonably warm for proper working and have not yet had any trouble from overheating. But should the weather warm up causing the motor to heat up, the radiator can be exposed more or entirely uncovered if necessary.

It is well known that kerosene attacks rubber and will destroy the rubber hose unless it is first dipped in shellac as advised in the issue of November 16.

I wish to refer interested readers to R. R. Essery's letter published in the December 7 issue of Motor Age in which he says that kerosene is the only solution which has given him absolutely no trouble.

The statement of January 18 seems very absurd to me in that it says that the solder in the radiator was partially destroyed. That was certainly a bad case of overheating to melt the solder in the radiator. Did Motor Age's representative make any examinations? Possibly there was a leak somewhere and the kerosene had all escaped. Someone may have accidentally or intentionally opened the drain cock. The pump shaft may have been broken. Or it might be that the passages in the radiator were very narrow and had become clogged with partially dissolved rubber.—Charles L. Patterson.

WANTS TO BE ROAD TESTER

McAllen, Texas—Editor Motor Age—Will Motor Age answer the following questions through the Readers' Clearing House columns:

1—What salaries are paid to road testers in factories?

2—Should a young man of 22 years, with 3 years' of private cross-country driving, be able to get a position as tester?

3—What are his duties?

4—Would it be necessary to work up to the position of road tester, or could one start in at that, provided one is a good driver and knows the car?—A Reader.

1—Salaries of road testers range from \$15 to \$25 per week.

2—Not without previous experience in the factory or shops.

3—To see that the car is correctly adjusted in all its parts, and that it develops the requisite speed and hill-climbing ability; to make road adjustments.

4—It would be necessary to begin in the factory and work into the position.

From the Four Winds



MOTOR SLED USED BY COLUMBUS ENTHUSIAST

TACOMA Club Posts Signs—The Tacoma Automobile Club has recently placed signs along the route of the Pacific highway in both directions, north and south, bearing the distances to Tacoma and the insignia of the club.

Motor Car Fire Apparatus—Fire Chief C. W. Ringer has ordered all motor car fire apparatus and motor cars to maintain a maximum of 35 miles an hour in the future. Heretofore there has been a wild race to get to the fires, the horse-drawn salvage corp rigs racing with the motor auxiliary fire squad truck.

North Dakota's Profits—In 6 months after July 1, 1911, North Dakota netted \$17,661.80 from motor taxation under the state law, which became effective last year. The sum was apportioned to counties for improvement of roads. The income of the department was \$22,447, covering 7,261 motor cars and 261 motor cycles.

Hyperion Club Election—At a meeting of the Hyperion Field and Motor Club of Des Moines, Ia., Ralph Bolton was elected president. W. E. Moyer, president of the Des Moines Automobile Dealers' Association and also president of the state association, was made vice-president. The other officers named were D. L. Skinner, secretary, and G. E. MacKinnon, treasurer.

Motor Sled at Columbus—Fred Hare, of Columbus, O., assisted by several who are mechanically inclined, has designed a unique vehicle in the form of a motor sled which was a common sight on the streets of Columbus during the extended cold spell early in January. The device consists of two sleds attached to each other by heavy frames. On the frames is mounted a 4-horsepower Indian motor cycle engine, retaining the transmission of the motor cycle. Motive power is gained by using a motor cycle wheel

equipped with a chain. The steering gear consist of a motor car wheel attached to the front sled in such a manner as to make it easily turned to either side. The engine control is at the side of the frame and is worked by the feet.

Another Racing Team Promised—The Indiana Motor Mfg. Co., of Franklin, Ind., builders of the Continental 30, are preparing to put two racing cars on the track the coming season. The cars will be specially constructed with regard to wind resistance.

Novel Insurance Suit—One of the most novel suits ever brought before a court involving motor cars has been filed in the superior court in Massachusetts by Mrs. Catherine J. Cronin, of Chicopee, mother of John D. C. Cronin, who was killed in a motor accident in Westfield some time ago. Mrs. Cronin seeks to recover \$20,000 on an insurance policy issued on the life of her son. The question at issue is whether the driver of the car which turned turtle when nearing Westfield is a common carrier of passengers. If the court decides that he is the woman will recover the full amount, otherwise she will get but \$10,000, it is said.

Adds to Road Fund—In connection with the great highway scheme now being carried out in Wisconsin at the cost of millions of dollars, the Wisconsin highway commission has just gained a concession that will mean a large addition to the funds for building good roads, although in an indirect manner. The railroads of Wisconsin have, after several conferences with highway experts, consented to reduce the freight rates on stone in carload lots for use in highway improvement or construction to a figure that is practically nominal. The rate for 10 miles will be only 5 cents per ton, and 10 cents for 20 miles, the 100-mile rate being 25 cents

per ton. The action of the railroads is regarded as proof of a complete understanding of the value of good roads to the transportation companies.

Abbott Asks Reinstatement—Evidently the Abbott Motor Car Co. has changed its mind about withdrawing from the racing game, for it has filed a strong protest with the contest board of the A. A. A. against the 6 months' suspension order recently made. The company asks to be reinstated and expresses its willingness to abide by the rules in the future.

Chambersburg Election—Arrangements were made for the holding of a banquet in order to advance the cause of good roads and promote good fellowship among motorists in Pennsylvania by the Chambersburg Motor Club, at a meeting held last week. The following officers were elected for the ensuing year: President, T. J. Brereton; vice-president, Dr. W. F. Skinner; secretary, D. O. Gehr; treasurer, Carlton Speer.

Will Hold Road School—The first annual road school under auspices of the new Wisconsin highway commission will be held in Madison, Wis., on February 12 to 16. Governor Francis E. McGovern, a well known good roads enthusiast, will open and preside over the sessions. More than \$2,500,000 will be expended during 1912 in public moneys in Wisconsin and the school will be for the special benefit of the governmental units which take the initiative in highway building and improvement under the new statute which grants an amount equal to all expenditures for good roads made by township and county.

Flanders Motor-Sleigh—During the Chicago show there was exhibited on the streets the Flanders motor sleigh, which is made up of one complete Flanders 20 chassis, with the addition of another chassis frame, carrying only a stock front axle, on it. This chassis frame is bolted with its rear spring hangers, to the rear of the forward driving chassis. The front axle of the rear frame carries a complete stock steering control, and runners instead of wheels, enabling this long wheelbase to be easily turned in a small radius, by means of its forward and rear control. The rear seats are elevated slightly, so that the rear steersman can watch the forward man, and turn with him. Runners are put on the forward axle and the rear carries the wheels with the tires and skid-chains, this furnishing the drive. The Flanders 20 engine has sufficient power to drive this novel vehicle and its load on the high gear, notwithstanding the drag exerted by the four runners. It was de-

signed and used by F. B. Willis, branch manager of the Studebaker Corporation, at Indianapolis.

Improving Detroit-Chicago Road—The Wayne county road commission of Michigan has laid out \$500,000 worth of work for 1912 and will employ from 1,000 to 1,200 men all season. The Michigan avenue road, which leads directly from Detroit to Chicago, will be completed to the Washenaw county line, and will be one of the finest stretches of highway in the country. It is now completed as far as Wayne, 18 miles from the Detroit city hall.

Rhode Island's Bill—What is expected to develop into the bitterest fight of the present session of the Rhode Island legislature probably will develop when the highway bill recently introduced by Senator Edward E. Arnold of Coventry is reported back to the senate. It is claimed that the republican leaders are in favor of the bill which carries out the recommendation of the state board of public roads. The act provides that the \$600,000 bond issue authorized by the voters at the last election shall be expended on roads in Providence, Kent and Washington counties, and practically cuts Newport and Bristol counties out of any apportionment of the issue.

Mardi Gras Plans—New Orleans motor enthusiasts are looking forward to two events of unusual importance this month—the races, during Mardi Gras, February 17 and 18, and the motor car exhibition February 21 to 25. Seven events for each day of the meet have been arranged and stock cars from practically every agency in the city have been entered. Improvements are being made on the track. The banks on the turns are being made longer and higher. A second fence is being constructed 30 feet back from the track fence as a safeguard against possible accidents. No spectators or cars will be allowed in the open space between the two fences. Several thousand dollars will be spent in decorating the Washington artillery hall for the show. Without a single exception every local agent has agreed to take part

in the exhibition and there is every reason to believe that it will be the most representative display of motor cars that has ever been attempted in the south.

Tire Life in New Orleans—Deterioration of tires in New Orleans is rapid, it is said. In addition to bad streets, the continual moisture and heat during 7 months of the year tend to the necessity of frequent renewals. Three thousand miles is considered the maximum life of a tire, it is asserted.

Club at Jeffersonville—Motor car interests of Jeffersonville, Ind., have organized the Jeffersonville Automobile Club and already plans have been made for a vigorous good roads crusade. Special effort will be made to obtain better roads in the immediate vicinity of Jeffersonville. The club has fifty charter members and officers as follows: President, John Schlueter; vice-president, William O. Sweeney, and secretary and treasurer, Elmer M. Frank.

Old Orchard Bills Meet—At a meeting of the Old Orchard Automobile Association it was voted to ask the A. A. A. for a sanction for a race meet to be held at Old Orchard, Me., July 4, 5 and 6 next, when it is expected that a big carnival may be arranged. The association has been organized with the following officers: L. C. Goodwin, president; A. E. Morse, vice-president; W. J. Gilpatrick, secretary; Charles E. Goodwin, treasurer, and W. T. Kincaid, chairman of the contest committee.

Nebraska Loses Secretary—D. E. Watkins, secretary of the Nebraska Automobile Association, has resigned to accept a similar position with the newly organized Kansas association. The Nebraska club was organized less than a year ago, and Mr. Watkins built it up from an organization of three clubs to one of sixty county clubs, with 3,000 members. Kansas is anxious to have him duplicate the feat there. W. J. Kirkland, secretary of the Omaha Motor Club, was elected by the directors last week to succeed him. It was decided to raise the initiation fee

from \$1 to \$2 so that the officers would have more funds to advance the needs of the association.

New Tag Law—An ordinance affecting license plates went into effect in New Orleans January 1. The regulation requires a plate both in front and in the rear. The tax is \$5 a year, which is added to the fund for the maintenance of roads. This system takes the place of an indefinite license costing \$2.50.

Horse vs. Motor Speed—The Indianapolis fire department is making a close observation of the motor apparatus in service and has found that the motor apparatus can travel four squares while the horse-drawn apparatus travels one. In a number of tests, motor apparatus stationed down town has reached the fires and been working before horse apparatus nearby arrived.

Ontario Registrations—The motor car license branch of the Ontario provincial secretary's department, has issued more than 12,500 licenses to car owners in this province since the beginning of the year. By the time the new list of licenses is ready for the printer on March 1, the total number will undoubtedly have reached upwards of 16,000. About 40 per cent of the 11,000 licenses issued last year was taken out by American tourists and visitors. Each license costs \$4, to which must be added another dollar for a chauffeur's license.

To Impound Cars—Chief Cowles, of the police department of New Haven, Conn., is considering the advisability of having a professional chauffeur attached to the police department so that motorists who leave their cars on the congested streets for hours at a time when the limit is only 15 minutes may be brought before him to explain their delinquencies. Under his plan the chauffeur would drive the cars to police headquarters after the style of the old law of driving animals to a pound, and when the owners came to claim them they would be told to obey the law in future or they would be summoned to court.



FLANDERS MOTOR SLED WHICH WAS BROUGHT OUT BY AN INDIANAPOLIS DEALER

MONTREAL—The King is now represented in Montreal by Frigon & Baker.

Philadelphia, Pa.—Parkin & Hodson, 2415-2417 North Broad street, have taken the local agency for the Commer truck.

Boston, Mass.—The Aristos Co. now is represented in Boston by Miller & White. Salesrooms have been opened on Boylston street.

Vancouver, B. C.—The name of the Pacific Garage and Auto Co., Cole agents, has been changed to the Metropolitan Motor Car Co., Ltd.

Columbus, O.—The New Columbus Automobile Co. has opened in a new location at 44-48 West Chestnut street. The old location was at 691 North High street.

Los Angeles, Cal.—The Olds Motor Works has recently established a direct factory branch in Los Angeles and installed D. L. Whitford as manager.

Philadelphia, Pa.—The Goodyear Tire Co. has removed from 1402 Ridge avenue to the large three-story building occupying a double lot at 207-209 North Broad street.

York, Pa.—The York Garage and Supply Co., 116-118 East Market street, has added the agency for the Metz cars in addition to its line of Pullman, Everitt, Stearns and Hudson cars.

Boston, Mass.—Frank E. Wentworth, New England distributor of the Overland line, has been appointed to a similar position with reference to Garford pleasure cars and trucks.

Tacoma, Wash.—Arthur A. Cook and Burton A. Cook have been appointed Tacoma agents for the Disco self-starting devices. The E. M. F. Northwest Co. also will handle the starters.

Boston, Mass.—J. W. Murphy, who for 2 years has been identified with the Garford, has been appointed manager of the truck department of the Whitten-Gilmore Co. to handle the Federal and Dayton trucks in the New England territory.

Kansas City, Mo.—Warren D. Oakes, manager of the Studebaker branch in this city, has resigned and will join his brother in the manufacture of motor car fans. The firm will be known as the W. H. Oakes Co. Headquarters will be at Indianapolis.

Boston, Mass.—Edward Wells, formerly assistant sales manager of the E. R. Thomas Motor Co. at Buffalo, who has been at the Boston branch for several months under Manager Halliday, resigned recently, but has since accepted an offer to accept his former position at the factory.

Toronto—The Wolseley Tool and Motor Car Co. has awarded a contract to erect a \$40,000 brick and stone garage at 81 Avenue road, Toronto. This warehouse is the first move of any English car manufacturer to establish themselves in Canada, and it is stated that if business warrants it, the Wolseley syndicate will invest

Brief Business

another half-million dollars in Canada in a motor factory.

Montreal—The St. Louis garage has the local representation for the Cutting car.

Rice Lake, Wis.—T. H. Field has reopened his garage here after a shutdown because of extreme cold weather for 1 month.

Omaha, Neb.—E. R. Wilson has contracted with Peterson & Funderman, of Battle Creek, for handling Lexington cars in that territory.

Boston, Mass.—Harry Esiner has secured the Massachusetts agency for the Eise-mann magneto and he is handling it from his salesrooms at 24 Cambria street, Boston.

Louisville, Ky.—The Hudson, formerly sold here by the McCormick-Montenegro Co., hereafter will be sold by the Urwick Motor Car Co., local agent for the Baker electric and Marmon.

Evansville, Wis.—The Frost Engine Co. is at work establishing a factory for the manufacture of gas and gasoline engines designed by F. S. Frost. The company is capitalized at \$20,000.

Detroit, Mich.—T. J. Toner, of the Studebaker Corporation sales department, has been assigned to the Pacific coast and has left for San Francisco. He will have entire supervision of the branches and agencies east of Salt Lake.

Boston, Mass.—The Stewart speedometer now is housed in a new home in Boston on Columbus avenue. The branch is in charge of E. G. Biddle. L. M. Snow, formerly secretary of the Bay State A. A., is the local traveling representative of the company.

Milwaukee, Wis.—The Wisconsin Auto Fender and Mfg. Co. has been organized here by George L. Sexton, B. S. Elliott and L. Born to manufacture fenders, guards and act as selling representatives for accessories, supplies, etc. The capital stock is \$15,000.

Toledo, O.—Statuary and works of art are being rapidly removed from the old Art Museum building on Madison avenue, and the structure will be remodeled to suit the requirements of the Ford Brothers Auto-Sales Co., which recently leased the building. The concern deals exclusively in used cars.

Racine, Wis.—The Specialty Brass Co. has been incorporated here with an authorized capital of \$25,000 to manufacture brass and aluminum specialties, lamps, parts, etc. The promoters, Henry Anderson, Charles Anderson and Lars C. Thompson, have been associated with the big brass companies in Racine and Ke-

nosha for many years. The plant will be located in Pleasant Prairie, near Kenosha.

Menasha, Wis.—W. A. Redner has leased the Onward factory building and is remodeling it into a garage and repair shop.

Boston, Mass.—F. Shirley Boyd is now handling the Dorian rim among his other lines from his salesroom on Boylston street.

Detroit, Mich.—R. G. Neighbors has been promoted to the position of sales manager of the Hupp Motor Car Co., of Detroit.

Baltimore, Md.—J. W. Lockard & Sons of Westminster, Md., have been designated as the Carroll county representatives for the Buick car.

Boston, Mass.—Manager Charles E. Fay of the Boston branch of the Ford is soon to move the salesrooms from the present quarters on Columbus avenue to 650 Beacon street, where a new structure is being erected purposely for the Ford cars.

Boston, Mass.—George A. Crittenden, who has been connected with the Lozier branch since it was started in the capacity of salesman, has been promoted by Manager Nettleton to be the traveling representative of the company for New England.

Davenport, Ia.—The Iowa Auto and Tire Co. has expanded considerably during the past few weeks, having established a painting and decorating department and storage room at 929-31 West Second street and opened a garage and display room at the Main street garage.

Mauston, Wis.—An aluminum factory is being established here by experienced aluminum men from Two Rivers, Wis., which is the center of the industry in the northwest. Walter Marvin, Emil Frenz and Robert Stegman, who have been associated with the big aluminum interests at Two Rivers, are behind the project.

Pittsburgh, Pa.—The rapidly increasing demand in Pittsburgh and vicinity for the asbestos, magnesia and other products of the H. W. Johns-Manville Co. has necessitated a move from its present location in Liberty avenue, above Ninth street, to larger quarters at the northeast corner of Wood street and First avenue.

Indianapolis, Ind.—The following new Cole agents for New York state have just been secured: Peterman Motor Sales Co., Jamestown; R. L. Cooley, Batavia; William H. Hopkins, Bath; North avenue garage, Fishkill-on-Hudson; J. Harry Cook, Cooperstown, N. Y.; Dewar & Diefendorf, Oneonta, N. Y. Other Cole agency appointments are: Spokane Cole Motor Car Co., Spokane, Wash.; J. P. McCullom,

Announcement

Dodge City, Kas.; Shafer Motor Car Co., Rochester, N. Y.

Chicago—S. Breakstone has discontinued the Hagstrom Brothers Manufacturing Co. line and is now handling the Hopewell tire case.

Detroit, Mich.—P. W. Schulte & Sons, 701-707 Grand River avenue, have taken the local agency for the Paterson line of motor cars.

Wellston, O.—The Wellston garage has taken the agency for the Overland, Jackson and Brush. In addition the concern sells the Dart trucks.

Philadelphia, Pa.—The Cutting Sales Agency recently removed to larger quarters at 638 North Broad street, with Charles Walton, Jr., as general manager.

Baltimore, Md.—The Paige-Detroit car will be handled in this section by Harry M. Crouch and Percy W. Schall. They will be located at Ditch's Garage, Mont Royal and North avenues.

Washington, D. C.—The Matheson Motor Co., of Washington, has been formed to handle the Matheson in this city. E. K. Fox is head of the company, which has secured quarters in a new building adjoining the Masonic Temple, of New York avenue.

Portland, Ore.—The O'Gorman Rim Co., consisting of J. S. O'Gorman, president, and J. C. O'Gorman secretary and treasurer, has succeeded the firm formerly known as the O'Gorman-Younie Co. The new firm will represent the Michelin Tire Co. and handle specialties.

Boston, Mass.—Phillip E. Hawley, who has been closely identified with the manufacturing end of the motor industry for several years in Detroit, has been sent to Boston to take charge of the Boston branch of the Studebaker Corporation. He will look after the wholesale business throughout New England.

Omaha, Neb.—The T. G. Northwall Co. has made contracts for Brush, Courier and Detroit cars with the following dealers: I. C. Eastman, Clarinda, Ia.; Whittaker Implement Co., Red Oak, Ia.; William Gehrts, Murdock, Neb.; C. J. Hanson, Harlan, Ia.; H. P. Hanson, Exira, Ia., and Aurora Lumber Co., Flakington, S. D.

Davenport, Ia.—C. H. Adams, for many years secretary-treasurer and general manager of the Marseilles Mfg. Co., of Marseilles, Ill., and stockholder and director in the Marseilles company, of East Moline, has severed his connection with the company to accept the position of general director of purchases with the Western Implement and Motor Co., of Davenport, which recently took over the Colby Motor Co., of Mason City, Ia. Mr. Adams will

also be trade manager for the southern states.

Denver, Colo.—A. H. Renard has recently become manager of the J. I. Case Co.'s Denver branch.

Omaha, Neb.—The E-M-F Omaha Co. has changed its firm name to the Studebaker Corporation of America, Omaha Branch.

Syracuse, N. Y.—Pullman cars are to be handled in central New York territory during 1912 by the Acme Garage Co., Inc., East Water street.

Jonesville, Mich.—Carpenter & Proper have established themselves here as dealers in agricultural implements, motor cars and supplies. They are handling the Krit.

Kansas City, Mo.—The Marquette agency has been taken by the International Auto Co., Fifteenth and Troost streets. H. A. Berryman and Noel F. Gilbirds are the owners.

Menasha, Wis.—F. E. Kenfield has purchased the business of the Menasha Auto Co., Milwaukee and Broad streets, owned by Philip Heup. The company name will be continued and the business will be managed by Arthur Walsh, of Appleton.

Ottawa—W. W. Wylie, former manager of the Ottawa Car Co., has organized and is head of a new concern, which has just been incorporated under the laws of Ontario as Wylie, Limited, capitalized at \$250,000. Sales rooms have been opened on Albert street.

Washington, D. C.—The name of the Hudson Sales Co. has been changed to the Storm Motor Car Co. The company is located at 1012 Fourteenth street, N. W., and in addition to the Hudson has taken the National agency. C. M. Storm is the general manager.

Omaha, Neb.—The Cartercar Nebraska Co. has closed contracts with the following for handling Cartercars: Young & Kebler, of Woodbine, Ia.; J. P. O'Neil, Sterling, Neb.; Peter Burton, Amsley; W. G. Erstline, Prairie Home, and Daulph & Don, of Hastings.

Milwaukee, Wis.—The Jonas Automobile Co., 421 Wells street, for many years representative of the Peerless and Cadillac, is now confining its efforts to the sale of the Cadillac. The Chicago Peerless branch will handle Milwaukee business until new representation is secured.

Boston, Mass.—Work upon plans for a new garage to be used by the Edison Electric Illuminating Co. of Boston was begun a few days ago. The company recently bought a large tract of land for the purpose and a one-story brick and concrete building with floor space large

enough to accommodate more than 150 vehicles will soon be built.

Syracuse, N. Y.—The Syracuse agency for the Schacht has engaged Woodworth Campbell as its sales manager.

Montreal—The Legarre-Gadbois Automobile Co., Ltd., Montreal and Quebec, is handling the Mitchell car for the province of Quebec.

Omaha, Neb.—The Silent Motor Car Co., of Lincoln, has made arrangements with the W. L. Huffman Co. to take charge of the Omaha agency.

Boston, Mass.—H. E. Stover has accepted a position with the Thomas Cotter Co. handling accessories as traveling representative in New England.

Baltimore, Md.—The agency for the Abbott-Detroit in Maryland, the District of Columbia, Virginia and West Virginia has been placed with the White Automobile Co.

Lake Geneva, Wis.—Oscar E. Romare, of Williams Bay, will establish a garage and repair shop in the Van Slyck building, which he has leased for 10 years. He will open March 1.

Kansas City, Mo.—George L. Schofield, formerly of the United States Motors Co., St. Louis, Mo., has been appointed district manager for the American Motors Co. at Kansas City.

Santa Ana, Cal.—The Fourth Street garage has been sold by the owner, A. B. Hendrickson, to the owners of the Orange City garage, of which Otto Kolberg and H. R. Gradner are the owners.

Indianapolis, Ind.—H. W. Meyer now is with the Frank Stanley Co. of Indianapolis, distributor of the R. C. H. He formerly was manager of the Planhard Manufacturing Co. of Kokomo, Ind.

Moline, Ill.—The Moline Automobile Co. has abandoned its policy of not having local agencies and has appointed Horst & Streiter, of Rock Island tri-city agents. The new firm has opened a garage on Second avenue and Fifteenth street.

Philadelphia, Pa.—The A. G. Spalding Co., 202-204 North Broad street, in addition to handling the Stevens-Duryea, closed with L. L. Barnes, of the King Motor Co., of Detroit, for the agency of the King car for eastern Pennsylvania and New Jersey.

Milwaukee, Wis.—P. C. Avery, Milwaukee, Wis., who has recently disposed of his electric lamp business to the Garage Equipment Co., of Milwaukee, is preparing to put on the market a chemical for enriching gasoline under the name of acetrol. He will locate in Chicago.

Denver, Colo.—The Colorado Motor Co., 1624 Broadway, formerly agents for the Peerless and Marmon, has discontinued business. Paul S. Tobin, manager, has joined the selling force of the Mathewson Automobile Co., 1644 Broadway. The Peerless agency has been taken over by the

Maxwell-Chamberlin Motor Co., 1241 Broadway.

Louisville, Ky.—The Rommel Motor Car Co., local agent for the Brush and White, has acquired the agency for the Marathon.

Montreal—The Case Motor Car Co. has opened an agency in this city for the sale of the Case car. Its garage is situated at 609 Mount Royal East.

Memphis, Tenn.—Victor Bendix has been appointed southern district manager of the Haynes Automobile Co., with headquarters at Memphis.

Syracuse, N. Y.—J. O. Bradeen, of the Buick-Keating Co., agent for the Buick pleasure cars, has taken the agency for Buick light delivery wagons.

Sheboygan, Wis.—The Rummele Auto Co. has been obliged to take additional space and has leased the Illig building on Center avenue for surplus storage and repair auxiliary.

Atlanta, Ga.—H. G. Moore, who has been manager of the local Velie branch, has resigned, and E. S. Scouten has been named as his successor and is in charge of the Atlanta office.

Milwaukee, Wis.—W. B. Crabtree will establish the general sales offices of the Fort Wayne Electric Co., of Madison, Wis., and Fort Wayne, Ind., in the Majestic building at Milwaukee.

San Francisco, Cal.—Austin Kantee, formerly president of the Phoenix Rubber Co., distributor of Republic tires until the recent establishment of a Republic branch here, is now connected with the Kelly-Springfield agency.

Chicago—E. M. Lubeck has become wholesale manager for the Chicago Studebaker branch, succeeding F. M. Busby, who has joined the Louis Geyler forces, looking after Hudson wholesale business in Geyler's territory.

Detroit, Mich.—On account of the increasing business of the Jeffery-Dewitt Spark Plug Co., of Detroit, that concern has opened a New York office at 1789 Broadway, from which branch the eastern business will be handled.

Change in Thomas Managers—Gaylord Warner, manager of the Chicago Thomas branch, is retiring from that position in order to re-enter the railroad business. He will be succeeded February 10 by E. D. Hand, from the factory at Buffalo.

Boston, Mass.—A. L. White, formerly a member of the firm of Ware, White & Leatherbee, handling the Bergdoll cars, has become special factory representative for the Standard Woven Fabric Co. in Boston, with offices at 903 Boylston street.

Evansville, Wis.—The Frost Engine Co. has been incorporated here to manufacture and market gas and gasoline engines designed by F. S. Frost. The authorized capital is \$20,000 and the promoters include F. S. Frost, C. J. Pearsall, T. C.

Rocent & Co. Incorporations

New York—American Elastic Wheel Co., capital stock, \$50,000; to manufacture parts and accessories; incorporators, C. Feroci, Frank Cousi and F. P. Ward.

Boston, Mass.—General Automobile Co., capital stock, \$15,000; incorporators, L. M. Cotton, H. P. Bell and L. W. Peters.

Chicago—Auto Supply Mfg. Co., capital stock, \$50,000; to manufacture and deal in supplies, etc.; incorporators, Carl Youngberg, Oscar Albertson and A. W. Olson.

Freeport, Mich.—Freeport Cant-Slip Co.; to manufacture trucks and hand screws; incorporators, George Leonard and N. Bonma.

Union Hill, N. J.—Clifton Automobile Co.; to deal in motor cars.

Columbus, O.—Ohio Punctureless Tire Co., capital stock, \$50,000; incorporators, Elmer O. Pettit, William Moore, C. N. Bowen, H. E. White, John F. White.

Milwaukee, Wis.—Wisconsin Auto Fender and Mfg. Co., capital stock, \$15,000; incorporators, H. Condyser, G. L. Sexton, L. Born and B. O. Elliot.

Martinsburg, W. Va.—Safe Auto Tire Co., capital stock, \$125,000; incorporators, J. W. Scott, G. W. Buxton, E. S. Bottomly, W. C. Kilmer and S. W. Walker.

Oak Park, Ill.—Quick Service Taxi Co., capital stock, \$2,500.

Bozeman, Mont.—Story Motor Supply Co., capital stock, \$25,200; to conduct motor car business; incorporators, N. Story, Jr., H. L. Casey and S. C. Crockett.

Chicago—Dewey Garage Co., capital stock, \$3,000; general motor car business; incorporators, A. C. Mabey, J. A. Martinkus and T. D. Brown.

Cleveland, O.—Motor Supply and Tire Co., capital stock, \$1,000; supply business.

Chicago—Englewood Motor Car Co., capital stock, \$1,000; to repair motor cars; incorporators, C. A. Londelius, Jr., A. E. Jackson and J. F. Wagner.

Dayton, O.—Imperial Auto Sales Co., capital stock, \$10,000; incorporators, R. W. Meyers, W. W. White, A. F. Fiorini, R. F. Meyers and R. E. Kerstetter.

St. Louis, Mo.—Universal Motor Truck and Tractor Engine Co., capital stock, \$250,000; general motor traction engine business; incorporators, William H. Taylor, John Beltram and A. R. Shaffer.

Cleveland, O.—City Auto Livery Co., capital stock, \$5,000; incorporators, George B. Harris, E. E. Rodd, E. A. Close, S. M. Davis and F. J. Kilrain.

Quincy, Ill.—Gem City Auto Exchange, capital stock, \$2,500; to manufacture, repair and deal in motor cars; incorporators, J. W. Myers, H. M. Sheer, E. C. Skinner and C. W. Bronson.

St. Louis, Mo.—Victor Buggy and Auto Top Co., capital stock, \$2,000; buggy and motor car tops; incorporators, O. E. Carter, R. F. Perdue, F. Roband.

Hartford, Conn.—Hartford Machine Screw Co.; to manufacture combined water and air pump for motor car use.

Seymour, Conn.—Seymour Auto Co., capital stock, \$4,000; incorporators, M. L. Warner, T. S. Coleman, E. S. Clark.

Pittsburg, Pa.—American Tractor Co., capital stock, \$5,000; to manufacture and deal in traction engines, motor cars and trucks.

New York—Apperson Motor Car Co., capital stock, \$10,000; to manufacture motor engines and vehicles; incorporators, H. H. Cannon, M. Cannon, M. E. Grasmuck, F. A. Grasmuck, M. C. Grasmuck.

New York—Starn Tire Mfg. Co., capital stock, \$500,000; to manufacture tires; incorporators, G. E. Starn, G. M. Cline and W. C. Mayne.

Philadelphia, Pa.—Roman Automobile Co., capital stock, \$5,100.

Houston, Tex.—Firestone Tire and Rubber Co., capital stock, \$10,000; incorporators, P. B. Talbot, E. D. Manley and J. T. Stuart.

Wilmington, Del.—American Spring Tire Co., capital stock, \$500,000; to manufacture spring cushion tires for motor vehicles.

New York—Franklin Motor Car Co., capital stock, \$10,000; to manufacture motor vehicles; incorporators, G. A. Tisdale, A. F. Avid and M. E. McDonald.

Birmingham, Ala.—Great Southern Automobile Co., capital stock, \$500,000; incorporators, E. F. Enslen, I. Adler, J. J. Kyser and E. F. Enslen, Jr.

New York—Fishback Motor Co., capital stock, \$3,000,000; incorporator, J. J. Wittenberg.

Chicago—Cartercar Motor Car Co., capital stock, \$10,000; to deal in motor cars; incorporator, W. R. Watson.

Grand Rapids, Mich.—East End Transfer Co., capital stock, \$100,000.

Grand Rapids, Mich.—Barber Motor Sales Co., capital stock, \$6,000.

Richardson, W. H. H. Johnson and A. E. Durner.

Boston, Mass.—The Ohio car is represented in Boston now by Herbert L. Converse.

Des Moines, Ia.—The Iowa-Nebraska Motors Co. is the newest addition to the local row. The company will handle the Penn cars.

Detroit, Mich.—A. A. Crumley has been appointed manager of the new Detroit branch of the Marquette company at 1237-1241 Woodward avenue.

Los Angeles, Cal.—Pipher Brothers & Austin are now distributors for the Cutting cars in southern California, with headquarters at Los Angeles.

San Francisco, Cal.—The latest entry in San Francisco's commercial truck field is the Detroit Motor Wagon, the agency for which has been established by W. C. Wyncoop Co.

Sheboygan, Wis.—August Prange, formerly of Potter, Wis., has opened a garage and salesrooms at 401-404 North Seventh street. He represents the Ford and Moline. The garage is 44 by 110 feet in size.

Waukesha, Wis.—The Waukesha Motor Co. has so many orders on its books that it has been obliged to run on a day and night schedule. Another addition probably will be built in the early spring.

Portland, Ore.—W. K. Chetwood, factory representative of the Kelly-Springfield Tire Co., has established a Portland office at 209 Front street. Agencies also will be established at Seattle and Vancouver, B. C.

Waukesha, Wis.—Ed. J. Christoph and John V. Atkin have formed a partnership as the Waukesha Auto Co., to handle the Buick line and operate a garage and repair shop. Temporary quarters are at 604 Martin street.

Milwaukee, Wis.—The Milwaukee Motor Co., Thirty-second and Burleigh streets, sustained a loss of \$3,500 by fire on January 27. A small warehouse caught fire from the forge shops. The loss caused no inconvenience.

Syracuse, N. Y.—The Goodyear Tire and Rubber Co. expects to occupy its new local branch store in the Duguid building, now under construction, not later than March 1. The company has temporary headquarters at 413 South Warren street.

Indianapolis, Ind.—W. C. Knight, who has been in charge of the Cincinnati sales agency of the Warner Instrument Co., has been transferred to Indianapolis as manager of the branch in that city, succeeding J. C. Stiles.

New York—The Connecticut Telephone and Electric Co. has opened its own office, stock and show room at 231 West Fifty-fourth street, New York City. A complete and well assorted emergency stock of Connecticut ignition devices is carried on hand.



Legal Lights and Side Lights

BLOW AT TRUCK INDUSTRY

ONE of the most surprising things that the Boston dealers found themselves up against last week when they went to the Massachusetts legislature to attend a hearing was to find the highway commission responsible for a bill that sought to limit the weight of motor vehicles in use on the roads of the Bay State to 6 tons, including the load on the vehicle. It was an astonishing proposition, for it would mean putting out of business entirely all trucks from 3 tons upwards. The bill was drafted by Colonel William D. Sohier of the highway commission.

The hearing upon the bill brought out lots of remonstrants but no sponsors for it other than Colonel Sohier, and even he tried to dodge the responsibility for it, in a way, it is said.

MANY MASSACHUSETTS BILLS

The usual grist of motor bills have been poured into the Massachusetts legislative hopper this year. Among them are some of the usual radical measures that bob up with never a chance of passage. Others have merit in them.

The highway commission has drawn up three bills based upon the recommendations in its annual report. One of these is relative to motor trucks on the highway. The amendment to the law allowing the commission's investigators to go outside the state to make inquiries where Massachusetts drivers have figured in accidents is one that will not be opposed. Then there is another measure asking that the appropriations for highways be increased to \$1,000,000. That is well worth serious consideration because the usual \$500,000 appropriation for construction that has been allowed each year for the past 5 years ends with 1912. So additional revenue is necessary. The bill was favored by motorists at the hearing recently. If this bill goes through then there is a better chance for Mayor Fitzgerald to get some sort of legislation to get money for the parkways. The mayor has filed two bills, one in the senate and the other in the house, designed to bring about such results. The house bill as drawn up seeks to have the fines revert back to the counties. The other bill has been introduced through the senate and it seeks to have the motor law amended so that the driveways used by motor vehicles in the metropolitan and Boston park systems shall come under the highway commission appropriation fund.

There are three bills at least based on the use of signaling devices. The Automobile Legal Association has introduced one which is so worded as to compel motorists to use an abrupt sound sufficiently loud to be heard above the traffic, and it makes

it unlawful to make any such sound except as a warning.

Francis Huturbis, Jr., counsel for the National Automobile Association, has put in a bill which seeks to eliminate from the motor law governing sounds the words "harsh and objectionable." He bases his bill upon the fact that it is an easy matter now for police officials to cause an arrest for an alleged sounding of a harsh, objectionable warning. There have been such arrests here.

There is another bill on the subject. It is put in by James D. Tyler and it provides that horns used on motor vehicles be uniform in sound and shall conform in strength and character to a standard established by the highway commission. The trouble with such a bill is that it would force the commission to pick out some certain make of horn, perhaps, and exclude all others.

The National Automobile Association also has presented two more bills, one of them seeking to eliminate the 8 miles per hour part on going around corners and intersecting ways. In place of this the other bill provides that motorists must slow down or even stop when conditions demand it as such spots.

A bill also has been put in that seeks to tighten up the penalties for disobeying the motor law. For instance, it provides that the fine for violating the law instead of its being \$25 for first, \$50 for second and \$100 for third offenses the judge is allowed to impose a fine of \$100 for a first offense if he feels so disposed. Another section changes from 10 days to 1 year the imprisonment clause and it also wipes out the three conviction section for revoking a license and places it so that after two convictions in a year the license shall be revoked.

There is another bill which seeks to jump the fine up to \$1,000 and a year's imprisonment where a person figures in an accident and someone is injured. Where a person is killed the fine and imprisonment is placed at \$5,000 and 3 years. A similar bill was up before. Then there is the bill seeking to have cars so geared as to prevent their being operated at more than 30 miles an hour. There was a bill of the same sort up at previous sessions and it was killed. As a matter of fact the greater number of accidents happen when cars are going at 10 to 15 miles an hour and such a bill would not lessen them.

There is a bill that provides that applicants for professional chauffeurs' licenses shall have at least 18 months' shop and road experience before being able to apply for a license. It is somewhat of a selfish plan to keep many young

men thoroughly competent to drive cars from applying, and it is thought the committee should throw it out. There is a measure that makes an owner of a car criminally and civilly responsible for the accidents that may happen provided such owner is in the car when it happened. Another bill provides that in an action for damages proof that the injury was done by a certain vehicle with proof of the number of such motor vehicle shall be prima facie evidence that it was being operated by the owner or his servant. There is also a bill providing that every one who owns, leases or controls a motor car shall file a bond with the highway commission of \$5,000 as security for any judgment obtained against a person for injuries.

According to that bill the highway commission will be a sort of clearing house for accidents. Another bill that seeks to add additional burdens on the commission unnecessarily seeks to have it furnish to the police departments of every city and town the number, name and residence of the owner, horsepower, maker, etc.

Then there is the bill requiring that all applicants for licenses to drive motor cars shall be examined by the highway commission for physical defects. Here the commission is to have a surgeon's department as an adjunct.

The bill seeking to make the owners of sight-seeing vehicles file a bond of \$5,000 for each passenger carried is up again. It was defeated by the committee and a like fate probably will await it this year. There is the bill put in by the highway commission so that if a person sells his car and seeks a rebate he must make application before September 1 in order to get it. Now there is no time limit.

SALESMAN MAY BE CHAUFFEUR

A salesman employed by a motor car concern or agency becomes a chauffeur within the meaning of the law when he drives a car through the streets to demonstrate it to a customer, according to Judge Maul's decision in the city court, Buffalo. R. A. Meyers, an employe of John A. Cramer, a Buffalo dealer, was arrested for driving a car without a license. Judge Maul based his decision in the following clause of the Callan law: "The term chauffeur shall mean any person operating or driving a motor vehicle as an employe or for hire." The salesman was fined \$5 by the court. The Cramer Automobile Co. will have the case appealed. In view of the fact that Charles Thaddeus Terry, chairman of the A. A. A. legislative committee, holds an opposite view and has expressed himself that way, this legal fight should be interesting.

TO INCREASE CAPITAL—The Duplex Motor Plow Co., of Chicago, announces it will increase its capital stock from \$5,000 to \$300,000.

Adds to Engine Plant—The Automatic Motor and Engine Co., making the Church pneumatic system, has added 14,000 feet of space to its plant at 2015-19 Michigan avenue, Chicago.

Want Motor Apparatus—The committee on fire department of the Somerville, Mass., board of aldermen, at its meeting a few nights ago, recommended that \$19,000 be appropriated for a motor fire engine, a motor combination chemical and an aerial ladder truck. The recommendation will be accepted and the apparatus purchased shortly.

Tent Show Plans—Indications are that the space for the motor car show to be held in Indianapolis March 25 to 30 will all be taken within a short time. About one-sixth of the 65,000 square feet of space available was taken the day following announcement that the show will be held. As has been announced, the event will be in a huge tent encircling three sides of University park, and will be under the auspices of the Indianapolis Automobile Trade Association.

New \$100,000 Building Ready—The Olds Motor Works will open its new northwestern branch building at 1629 Hennepin avenue, Minneapolis, February 10. The building and equipment cost \$100,000 and was erected by a competitor, L. H. Fawkes, of the Faykes Automobile Co., and a neighbor. The building is three stories, with office on the ground floor, show room on the ground and second floors, garage on the ground floor, and stock room on the second. The shop is on the third floor.

Working on Kissel's Boston Branch—Manager H. B. Pruden has approved the plans for the new building to house the New England branch of the Kissellkar and work has started upon it already. It is to be located at the corner of Commonwealth avenue and Pleasant street, Boston. The frontage is 74 feet and the depth 200 feet. The salesrooms will be 70 feet deep and running the entire width of the building. The garage will be located in the rear. The building is to be two stories in height and will be ready for occupancy by August 1.

New Service Building Ready—A service station is just being finished for the J. W. Bowman Co., of Boston, agent for the Stevens-Duryea, on Vassar street, Cambridge. It is of steel and brick with reinforced concrete, and it has a frontage of 345 feet on Vassar street and depth of 90 feet, giving a floor area of 31,050 square feet. There is only one row of posts in the building and the roof is of saw-tooth construction. The place will be sub-divided into a stockroom, overhauling department, light repair section, adjustment room, machine shop, blacksmith shop, all being on

Among the Makers



NEW RAMBLER SERVICE BUILDING BEING ERECTED IN CHICAGO

the one floor and easy of access from one to the other. It will be ready for occupancy in a few months.

New Lansing Industry—Another promising manufacturing concern is to be added to the already long list of industrial enterprises in Lansing, Mich.—the Brown-wall Engine and Pulley Co., capitalized at \$25,000, which has filed articles of incorporation with the secretary of state and has commenced the manufacture of gasolines and governor pulleys at its plant on Michigan avenue. The officers of the new company are as follows: President, Homer D. Parker; vice-president, E. A. Brown; secretary and treasurer, Frank A. Wall.

Stevens-Duryea Plant Growing—The growth of the Stevens-Duryea company is evidenced by the recent purchase of 40 acres of land at East Springfield, Mass., upon which will be erected a series of factories in the near future. The first one will be ready for occupancy June 1, and will be four stories high with a length of 500 feet by a depth of 80 feet. This will give the company a floor space of 160,000 square feet. The company will erect other buildings later. The plant is on the line of two railroads and will give it ample facilities to ship its cars away without any delays.

New Stearns Building—An accompanying illustration shows the new building recently erected by F. B. Stearns Co., Cleveland, O., as the exterior construction was receiving the finishing touches. The structure was completed in record-breaking time, the contractors working night and day, Sundays and holidays, so that it might be completed and ready for occupancy by February 1. The new building more than doubles the floor space and production capacity of the Stearns Company's machine shops, and was necessitated by the constantly increasing business which is pouring in on the company. It will be remembered that only a short

time ago the company leased almost the entire plant of the Royal Tourist Car Co. so as to accommodate several of its manufacturing departments, operating it as shop No. 3.

Milwaukee Dealer Dies—Marion E. Wait, president of Wait Brothers, Wisconsin state agents for the Moline, died after a short illness on January 29, aged 51 years. He formerly was one of the largest agricultural implement dealers in Wisconsin and upper Michigan. The agency will be continued by William J. Wait, a brother, at the present Moline headquarters, 685-691 Third street.

Studebaker's Export Claims—Export statistics, lately prepared, show that, during the month of November, the United States shipped abroad 1,364 motor cars—virtually double the number shipped in the corresponding month of 1910. Of this total, the Studebaker Corporation claims to have shipped just 413 cars—more than 37 per cent. In detail the exports of the Flanders and E-M-F cars manufactured by the Studebaker plants comprised more than 15 per cent of the exports to South America; more than 51 per cent to Great Britain and Ireland, and more than 57 per cent to Australia and New Zealand.

Trade Credit Officers Chosen—The election of officers of the Automobile Trade Credit Association, held in New York, resulted: J. J. Cohn, Nonpareil Horn Mfg. Co., president; W. B. Lashar, Weed Chain Tire Grip Co., first vice-president; M. J. Martin, treasurer, and Franz Neilson, secretary and counsel. The annual report showed a healthy growth. During the past 12 months sixty members were added. Over 4,500 separate and distinct complaints against delinquents were made, involving claims amounting to \$240,000, of which, through the united effort of the membership at large and the secretary's office, 3,000 were settled or adjusted to the extent of over \$160,000. There was an increase in the year of 43 per cent in

and Dealers



NEW BUILDING ADDED TO STEARNS PLANT AT CLEVELAND

the number of complaints handled over the preceding year, and of 53 per cent in the number adjusted. Sixty-seven per cent of the amount involved in the complaints was adjusted.

Now at Oshkosh—The Oshkosh Automobile Dealers' Association, recently organized, will hold its first show and the first motor exposition in Oshkosh from February 27 to 29, inclusive, at Oshkosh, Wis. Sixty-two distinct makes of cars are represented in Oshkosh, a city of 36,000 population, and all dealers are members of the association. This will be the only show in Wisconsin outside of Milwaukee.

Rambler Service Building—The Rambler service building in Chicago will be one of the most complete in the United States. It is being erected on the northwest corner of Indiana avenue and Twenty-third street on a lot 150 by 165 feet. This property has been leased for a term of 15 years at a rental of \$165,000. The aim of the Rambler people is to give to their owners the most complete service that is possible. There are 700 Rambler cars running in Chicago now, it is claimed. The service and second-hand car departments will be located in the new service building, while the principal salesroom will remain at 1008 Michigan avenue.

Chief Graham, of Ottawa, Ont., intends to make recommendations to the board of control in the near future regarding the by-law regulating garages, gasoline tanks and storehouses where inflammable goods are kept. The chief would have all such places licensed in order to give the fire department supervision over all public and private garages. He will advise the board of control to amend the by-law, and will suggest several changes and additional clauses. "Smoking should not be allowed in any garage," said the chief, "and no open stoves kept in such buildings. I would suggest that dry pipes and open-head sprinklers be installed in every garage, whether private or public, and that

all tanks for the storage of oil or gasoline should be buried in the ground outside any building. Concrete vaults are dangerous because gas collects and is liable to ignite easily."

New Engine Concern—The Gifford Engine Co., of Lansing, Mich., has filed articles of incorporation with the secretary of state, the capitalization of the concern being \$50,000. The company will manufacture small gasoline engines. The factory will be located on East Shiawasse street. About thirty men will be employed. The officers of the company will be as follows: President, W. Arthur Gifford; vice-president, R. N. Wilson; secretary, J. K. Reed; treasurer, Frank L. Radford.

MacAlman Wins Drawing—At a dinner given by Manager J. B. McDonald, of the Hotel Lenox, to the members of the Boston Automobile Dealers' Association and members of the Bay State A. A. who handle motor cars, a drawing was held for the privilege of exhibiting a car in the lobby of the Lenox during show week. Just forty-nine cards were picked out and President J. H. MacAlman, of the Boston Automobile Dealers' Association, was the lucky man. He handles both the Stearns and the Columbia in Boston and hasn't decided which to exhibit.

Co-operative Delivery—A new plan of delivery of goods made possible by motor vehicles is to be tried out in Davenport, Ia., three of the large wholesale firms having established a central delivery system and a common garage with equipment of motor trucks to take over the delivery system of the separate institutions. The Davenport Auto Truck Co. is the name of the new concern. The central garage, which is 60 by 70 feet in dimensions, of concrete clear span construction, is in close proximity to the Sieg Iron Co., Sickles & Preston Co. warehouses and the plant of the Smith Bros. & Burdick Co., the location of the three firms favoring a centralizing of their

delivery systems. The plan is arousing much interest among local merchants and promises to develop into an extensive co-operative delivery system.

Studebakers to Celebrate—The Studebakers will celebrate the sixtieth birthday of their business at South Bend, Ind., next Sunday. Invitations have been sent to Studebaker dealers and a big turnout is anticipated.

Busy at Badger Brass Plant—The Badger Brass Mfg. Co. is making extensive improvements in its big works at Burlington, Wis., which will increase the capacity 40 per cent. The factory has been working day and night shifts for several weeks.

Buffalo Directors Chosen—The Buffalo Automobile Trade Association has elected the following to the board of directors for the ensuing year: Ralph E. Brown, John J. Gibson, Charles F. Monroe, George Ostendorf, William Densmore, Gustave C. Miller and E. C. Bull.

Brockton Dealers Organize—The Brockton Automobile Dealers' Association was formed at a meeting in Brockton, Mass., last week. It starts off with nineteen members, and it is expected that the entire twenty-five dealers will join shortly. At the meeting the following officers were chosen: Minot H. Bates, president; F. R. Young, vice-president; B. S. Neal, secretary-treasurer.

Texas Truck Plant Operating—The Wichita Falls Motor Co., which established a factory at Wichita Falls, Tex., for the manufacture of motor trucks a few months ago, is preparing to make extensive additions to its plant in order to increase its output. The factory is now turning out the trucks at the rate of five per day. This number will soon be more than doubled, it is announced.

Looking for Eastern Site—Representatives of the Dart Mfg. Co., of Waterloo, Ia., have been making a tour of Massachusetts seeking a site for an eastern branch for the Dart product. Fitchburg and Worcester have been visited and they also will go to Cambridge, where Mayor Barry has been trying to induce manufacturing plants to locate along the Charles river, he already having secured the Berkshire company from Pittsfield. He is after several others.

Ohio Company Election—At the annual meeting of the directors of the Ohio Motor Car Co., of Cincinnati, Charles F. Pratt was elected president and general manager, A. E. Schafer vice-president and factory manager, Robert Kennedy secretary, and O. M. Bake treasurer. The only change was that of Mr. Kennedy, who succeeds C. M. Anderson as secretary. Mr. Anderson resigned to enter business on his own account at Middletown, O. R. E. Northway remains as chief engineer, H. T. Boulder as sales manager, and C. E. Evans as assistant factory manager.



The Motor Car Repair Shop

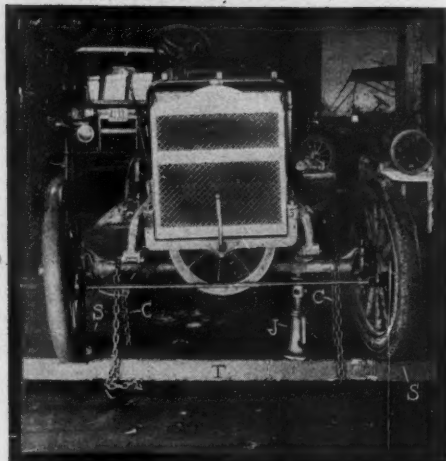


FIG. 1—STRAIGHTENING AN AXLE

It often happens that due to overloading or to striking washouts or holes in the road while traveling at high speed, that the axles of a motor car may be slightly sprung or bent; and as a result, instead of lining up properly the wheels will converge outward toward the bottom in a manner that will be both unsightly and injurious to the wheel bearings. In a front axle this also may render steering difficult. In Fig. 1 is shown a means employed in the Maxwell repair shops, Chicago, for straightening axles which have been slightly injured as above described. The equipment comprises a heavy piece of timber T with two curved sheet iron plates or skids S secured to the top surface of it, upon which the wheels of the vehicle are designed to rest. Two heavy chains and a powerful screw jack are used in connection with this timber. To rig up this equipment as shown in the illustration the timber is placed behind the wheels of the vehicle and tipped up on one edge so that the lips of the curved iron plates S are slipped under the tires close to the floor. The car can then be readily rolled up on to the timber as illustrated. The chains C, which are arranged under the timber before the car is rolled on to it, are next secured over the axle, then the jack J is placed between the timber and the under side of the axle in such a position that when put into operation the strain will be such that it will tend to straighten it out at the point where the bend occurs.

The Stearns Repair Department

In the Stearns agency, Chicago, there is a repair department which not only boasts a complete array of machine tools, but which also has a foreman who is by no means lacking in mechanical ingenuity. The articles of repairshop equipment and their arrangement are quite clearly shown in Fig. 2; whilst the ingenuity of the foreman is indicated by the sim-

ple means M, which he has devised for saving himself or his workmen from the laborious operation of lapping in pistons. More ingenuity is exhibited in the construction of the impromptu motor support S shown at the right in the illustration. Inasmuch as the shop is a very small one, making it necessary for the machine tools to occupy as little of the floor space as possible, the general arrangement of the various articles of equipment is comparatively good. The lathe L, which perhaps is most often used and on which the most accuracy of workmanship is necessary, sets close to the windows with its back toward them, where the workman has the advantages of the best light. The emery wheel E has been isolated as much as possible so that the emery dust is not thrown onto the machine tools and where it may be accessibly reached. It will be noticed that the emery wheel has a double ended spindle, with a buffing wheel on the end opposite to that containing the emery wheel. The buffing wheel is extremely useful in brightening up polished or plated parts of a motor before re-assembling them after an overhauling.

To overhaul a motor thoroughly it is almost essential that it be thoroughly cleaned up, and if in addition to a thorough cleaning the workmen insist upon brightening the plated or polished parts before assembling them into place, this little attention will have the same influence upon the owner or driver of the car that we all experience when the bootblack that shines our shoes is really conscientious in brushing the dust from our clothes and in painting the soles with a little liquid blacking or dressing. We all know

that when we send a pair of shoes to the shoemaker to be repaired we are more pleased to see them come back polished than in just a homely repaired but unpolished condition. In the same way is a motorist favorably or unfavorably impressed on receiving his car from the repairshop. If the motor is thoroughly cleaned up and the bright parts polished, he not only will be less likely to find fault with any little thing that he might imagine to be neglected, but he also will be more likely to recommend the workmanship to fellow motorists or prospective owners.

The repairshop equipment shown in the illustration, from left to right, comprises a portable crane C, the lathe L and emery grinder E, a small high-speed drill press, F, a can N for waste and rubbish, a handy table or rack T, for supporting tools used in connection with the lathe or drill press, a shaper R, a large drill press P, an arbor press A behind it, near the iron pillar at the right, and a power hack saw H, which for the time being is partly disassembled and converted into a lapping machine for lapping pistons into the en bloc casting of the Stearns four-cylinder motor. At the time the photograph was taken at this shop the regular stands for supporting motors during the time that they were being overhauled were in use in another part of the shop, so for the want of another motor support the two horses were arranged side by side, the motor rested upon them and then boards nailed across the ends to keep them from spreading. Thus a very substantial and convenient motor stand was quickly devised.



FIG. 2—SHOWING FEATURES OF SHOP EQUIPMENT IN STEARNS BRANCH, CHICAGO